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Rail Road News.

Troy and Boston Railway.

The Troy papers of Saturday announce the fact that the entire line of this road has been put under contract. The directors, in their circular, state that they have contracted with responsible men to build the road to Pownall, Vermont, 36½ miles—its entire distance—for $720,000; which includes every expense connected with building the road, even to iron and land damages; to be paid as follows. cash, $400,000; stock, $200,000, bonds $120,000.—If this plan is strictly carried out, it will prove, we should judge, a wise and judicious arrangement, as the company know just what their road is going to cost. For furniture of the road, and interests, they estimate $130,000, making a total of $850,000; of which $440,000 is subscribed; $225,000 more is taken by contractors—leaving a debt of $185,000. The contractors are to finish the road "on or before the 1st of July, 1851," if they can.

Large Locomotives.

The largest locomotive in the world, says the Madison Courier of the 11th inst., arrived at the wharf last night, for the Madison and Indianapolis Railroad. This locomotive when on the track ready to run, weighs about forty-three tons—is over 800 horse power. It was built in the shop of the Baldwins, in Philadelphia, under the superintendence of Mr. A Cathcart, with five cylinders, and is intended for this end of the road. We are told this engine is called the John Brough, on account of its great weight and for the great amount of business it is capable of doing.

Whom We Trust Our Lives To.

The report of the committee of the National Convention, recently in session at Cincinnati, mentions that the medical schools in our country are too many, the students too numerous, the professors too few and incapable, the quantity of instruction too limited, the quality too superficial, and the preparatory training insufficient. Yet are our lives entrusted to the persons who are pronounced capable after this kind of instruction.

Missouri Pacific Railway.

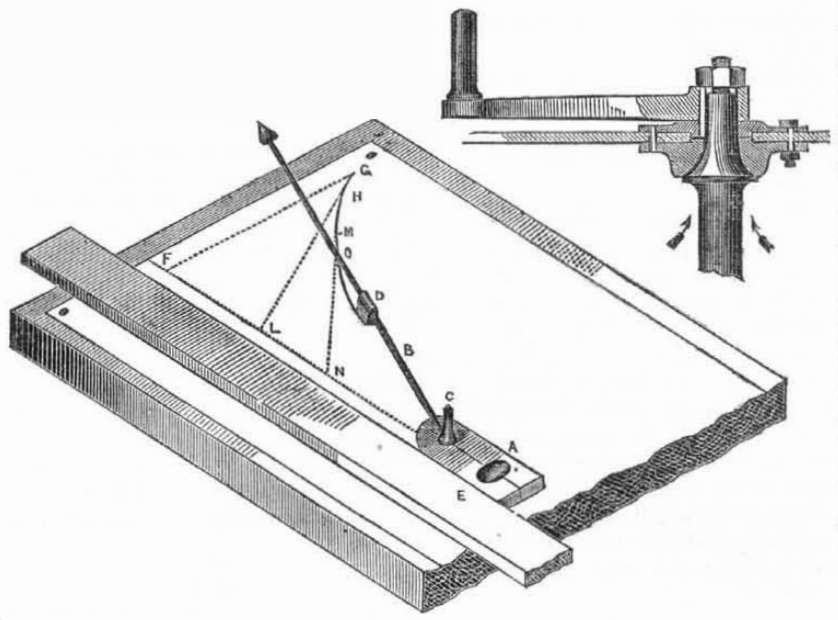
James P. Kirkwood, Esq., late Superintendant of the New York and Erie Railroad, has been appointed Chief Engineer of this Railroad. He is a skilful, able and experienced engineer. Chas. Minot, Esq., formerly superintendent of the Boston and Maine Railroad, has been chosen to fill the place of Mr. Kirkwood on the N. Y. and Erie R. R.

The Auburn and Rochester Railroad formerly consisting of two corporations but connected together, have consolidated themselves into one corporate body.

The direct railroad communication between New York and Boston, by way of New Haven and Springfield, is drawing so largely upon the Stonington route that the managers of that line are to reduce the fare from $4 to $2,50.

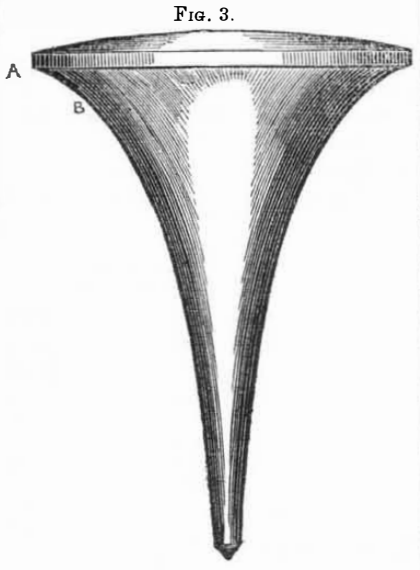
SCHIELE'S ANTI-FRICTION CURVE.

Figure 1. Figure 2.



On our list of Patents this week there is one granted to Mr. Christian Schiele of Frankfort, Germany, (a free city,) for the very important discovery of the true form of rubbing surfaces for regulating equal abrasion. This curve is applicable to all bearings of machinery, such as valves, journals, &c. The practical defect in rotating valves, is, that they gradually wear loose, owing to their working action and great friction, produced by forcible tightening up. This is the reason why so many rotary engines have worked well for some time, and then failed beyond a remedy. Irregular friction, with all its injurious effects, is well exemplified in the conical plugged stop-cock, for the amount of wear of the larger end differs from that at the smaller end, because *every point* of the former has a larger frictional traverse than any point in the latter. To lessen this evil, the plug is made nearly cylindrical, but the evil attending this form is that a little pressure

Fig. 3.

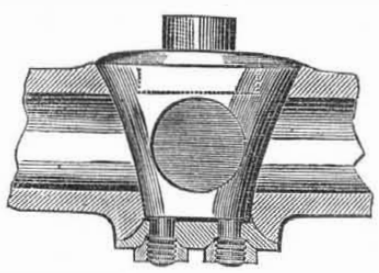


binds the plug in its socket, and very little wear causes the plug to sink considerably, hence the plugs and shells have to be made long and heavy. As the friction of a plug and its socket divides itself in such a manner that the product of the pressure multiplied by the length of way, is the same for any point in the rubbing surfaces, so the length of way being different in different parts, the pressure must differ also—being greatest at the smallest end; and as the largest end must be tight as well as any other part, the wear of the smallest part is obvious. The inventor Mr. Schiele, who is now residing in Manchester, England, from which place his papers were sent here, had his attention drawn to these things some years ago, which resulted in this invention, for which he obtained a patent in England in 1848, and now one for the United States, and to elucidate its principle and its application eight different figures are here introduced.

Figure 1 is the instrument used to describe the curve, and fig. 2 is a vertical section of a locomotive engine regulator constructed on the principle of the curve; fig. 3 is the generated curve itself, and fig. 4 is the vertical section of the shell of a stop cock, the plug of which is formed on the principle of the new curve—free from the imperfections of the old and possessing the property of keeping tight as it wears.

In figure 1 A is a small modern slide to which the rod B is adjusted by a pin C. D is a drawing pen affixed to a slide which can be moved upon the rod B to the proper distance for the curved required, and is kept in that end in a vertical position, by a spring which fits a groove. This direction of the sharp edge of the pen, D, is in a straight line to the pin, C. E is a ruler, along the edge of which the slide, A, is to be drawn. If the slide, A, and the rod, B, are so placed that the pin, C, shall be

Fig. 4.



at F, the pen at D, and the point at G; the centre line of the rod, B, will then be over the dotted line, G F, at right angles with the dotted lines, L N, (representing the axis of the curve to be drawn,) and if the slide, A, be then guided along the edge of the ruler, E, the pin, C will move along the dotted line, N, dragging, as it were, the pen, D, after it, which will describe the curved line, G H M O. F G, L H, M N, represent some of the tangents—the main features and principle of this curve being one, as shown in fig. 3, and the revolution of the curve drawn by the instrument, fig. 1, round its axis, L N, produces fig. 3, which has a surface with an equality of all its tangents drawn from the curved surface to its axis,—hence the use of the instrument, fig. 1. That the curve thus generated will produce the results stated, an equality of abrasion in both shell and plug, appears to be as self-evident as the axiom, "all the radii of a circle are equal."—[*Continued on 4th page.*]

Useful Receipts.

Straw for Hats.

In Italy the straw used for hats is made of rye, which is sown on poor land, very thick, and it therefore does not grow to above one half of its usual size. The rye straw used for braiding is cut near the ground when the grain is in the milk. It is tied up in small bundles, the heads cut off, and then it is dipped in boiling water, and put out to dry in the sun, taking care to take it in at night, and allowing no dew to get on it. When properly dried it is cut into proper lengths, drawn between the fingers with a blunt knife edge along the inside, and is used either for fine or coarse bonnets, as is desired. The tool used for splitting straw is a piece of wood five inches long, with a series of sharp spurs near one end, with a wooden or metal spring over the spurs—or, rather, one side of them—which is pressed down upon the straw to keep it spread flat while it is drawn over the spurs and split.

Straw is bleached by wetting it, and putting it into a tight box or barrel with some sulphur placed on hot coals in an iron pot, placed on the bottom of it, so as to allow the straw to receive the free action of the sulphurous vapor. Two ounces of bar sulphur will bleach a pound of straw. The straw must be kept from the sides of the box, by laying it on strips of wood running across the box or cask. It should not be taken out of the sulphur box in less time than four hours. Old straw, leghorn, or palm leaf hats or bonnets, may be whitened in this way, if they are thoroughly washed with a brush or sponge in soap-suds, before smoking. Straw must always be wet when it is braided, to prevent its breaking. An ingenious person can learn to braid or plait straw by taking a piece of old braid, and wet it, and pick it to pieces, and then braid it again.—When the straw hats are dry, after being cleaned, they are sized with size made of clean parchment parings boiled in water, and then hung out to dry; and are afterwards pressed with clean damp clothes and hot irons, on blocks which fit them to the desired shape.

Woolens and Furs.

Many persons suppose that the best way to prevent moths from getting into woolens or furs, is occasionally through the summer to hang these articles in the sun and rain. This is a great mistake, as it is by such exposure that the moths are most likely to get into them. On the contrary, in the spring, when the season is over for furs and woolens, they should be well shaken and brushed, and then wrapped up tightly in linen, laying among them lumps of camphor; handsful of fresh hops; cedar shavings, and above all fat pine wood shavings, all of which are preventives to moths; the camphor is by far the best for furs. All woolens, &c., should be kept during the summer unopened, in dark dry places such as drawers or large chests. Cedar presses are preferable to all others, for keeping cloths or other woolen articles. Hair trunks rarely fail to introduce moths. The month of June is the best time to put away flannels.

As you would save the strength and wind of a horse, drive slow up hill; and as you value your own and the life of the horse, drive slow down hill. But on level ground, if you must drive fast, draw a taut rein, and "let him slide."

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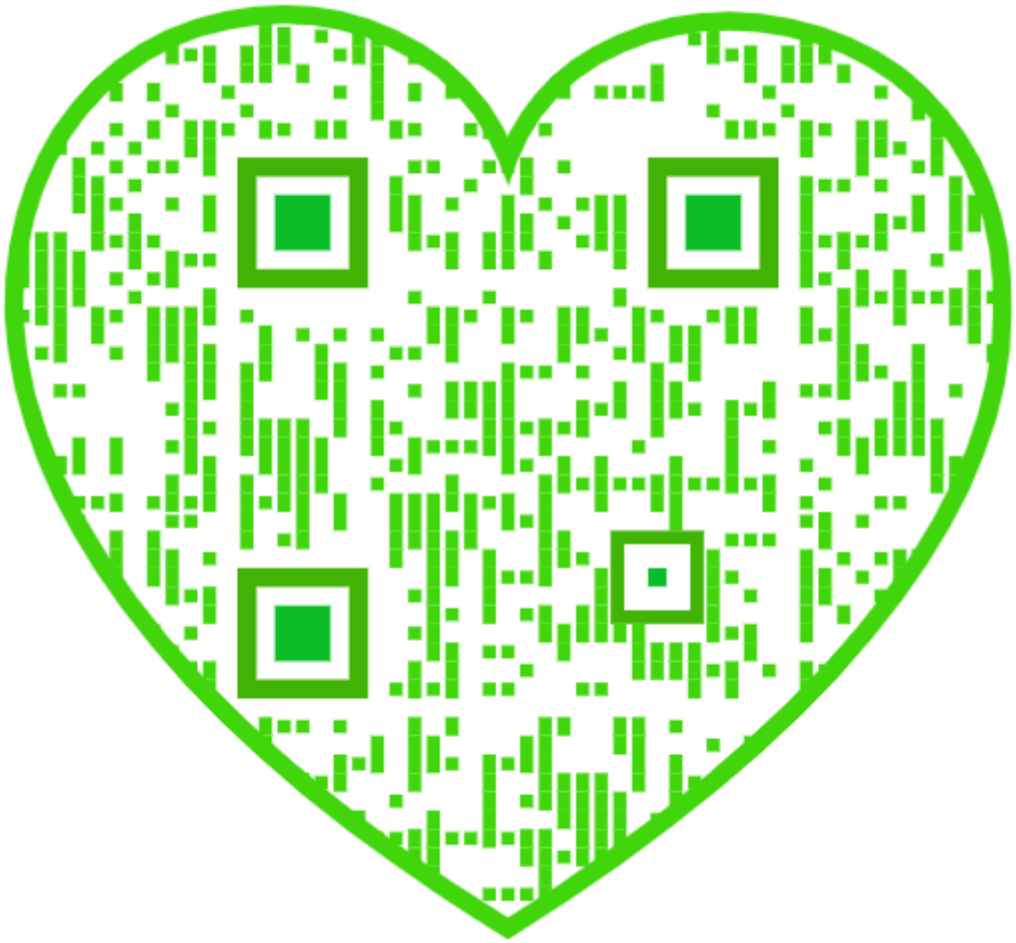

Miscellaneous.

Instinct.

Among the architectural operations which are in progress amongst us, we have noticed few with more interest than those of a neighbor pigeon, who seems to believe in "the right to labor;" he is evidently no communist, but decidedly fond of an isolated household. Extracting straw after straw from one of the lofts of a store in our rear, the pigeon has been conveying its spoil to a snug nook in a projection of the roof, and building a nest for its coming progeny. It was amusing to perceive how warily the industrious little builder consulted circumstances. If the merchants who occupied the store were busied in hoisting crates of goods to their upper lofts by means of a pulley, in the little penthouse which afforded the pigeon a shelter, the bird quietly bided its time for resuming operations. The straw from which its supplies were procured, were mostly in the third story of the building; yet the pigeon did not straightway ascend to its nook above after having chosen its straw, but flitted away for a brief space, in order to reconnoitre and to ascertain when it might be safe to resume operotions.

A strange thing this forecast of animals.

Instinct, says the Naturalist, is the operation of the principle of organized life, including both animals and vegetables, by means of the exercise of certain natural powers.—Reason is the operation of the principle of intellectual life, by the exercise of certain acquired powers.

But why may not God have imparted both to animals and vegetables a motive power which is in essence one and the same? When we consider the diverse developements of human reason, as for instance in the Hottentot, the Anglo-Saxon, and the American Indian of our own day, we may, in some measure, perceive how vastly a brutal or a vegetable organization must modify and limit the exercise of reason, provided reason should have been in any degree imparted to these organizations. "But the brute does not improve from age to age?" Nor would the human race progress, if they were furnished only with the brains and skulls of ourang-outangs.

Conscience and progressive reason are the grand distinctive attributes of man. These make him an accountable being—and "a little lower than the angels."

And yet scintillations of reason may have also been communicated to inferior orders in creation. **

A World's Fair in America.—The N. Y. Mechanics Institute.

At a meeting held at the M. I. Rooms on the 14th inst., the following resolution was offered by the President, the Hon. Zadoc Pratt, and adopted.

"Resolved, That a committee of three be appointed to consider the expediency of holding, in the city of New York, in the year, 1852, a World's Fair, for the benefit of the Mechanics and Artisans of this and other countries."

At the meetings which have been held subsequent to the above, a determination to carry out the spirit of the Resolution has been manifested, as the subject has always engaged the attention of members, and formed the subject of conversation. This is an enterprize we would wish to see carried out, and we hope the Mechanics Institute will do a great deal to bring it about. The Mechanics Institute holds its regular meetings every Tuesday evening at No. 105 Bowery.

Spontaneous Heating of Iron.

Cast iron when brought into the air after it had been formany years under salt water, has become red hot. In June, 1836, some cannon balls were raised from the ship Mary Rose, which sunk in a naval engagement near the Isle of Wight, in July, 1545, nearly 300 years before. These balls all became hot on exposure to the air, and fell to pieces. The cast iron gratings, after being long immersed in the porter vats in the large breweries of London, grow hot when the porter is drawn off, from a similar cause.

Sailing of the Grinnell Expedition in Search of Sir John Franklin.

The Advance and the Rescue, the vessels fitted out by the munificence of Mr. Henry Grinnell, of this city, for the Artic expedition, in search of Sir John Franklin, sailed last Friday, at noon, for their destination among the icebergs and enternal snows of the North. These vessels are under the regulations of the navy, in order to ensure discipline and provide against desertion. It is hoped, however, that there will be no necessity for enforcing those laws, for the brave fellows who volunteered upon this hazardous service have done so more for glory than for meaner considerations; and it was a touching sight to behold those ships sail down the bay, with the benevolent object in view of extricating from frozen seas, a man and brother, though of another country and clime, at the risk of sharing a similar fate themselves. Since they went away it has been reported that Sir John Franklin is safe—but it is doubtful news.

Irradiation of Light.

It is a curious fact, that if the same letters of the same size precisely are painted on two boards, the one white on a black ground, and the other black on a white ground, that the white letters will appear larger, and be read at a greater distance than the black. This is owing to what is called the irradiation of light. It depends on this, that the impression made on the bottom of the eye by bright objects extends a little wider than the actual portion of the organ struck by the light, and invading the space occupied by the darker objects, makes the brighter appear larger than they really are.

Chinese Newspaper.

There was lately exhibited in the Salles des Conferences of the Assembly, a copy of a new journal, the Moniteur of Pekin. It is written in the Chinese language, and printed with great care on very fine paper. It appeared in the Chinese capital on the 1st of January, 1850, and arrived in Europe by the last Indian mail. This first number contains, among other imperial documents, an ordiannce of the Emperor Tao-Kouang, forbidding any of his subjects to emigrate to California or the State of Costa Rica.

Maryland Institute for the Promotion of the Mechanics Arts.

By reference to our advertising page, it will be observed that the third annual exhibition of this Institute is designed to surpass all the former ones. The exhibition will continue four days, and no doubt it will be worthy of the city of Baltimore. The Maryland Mechanics Institute is a chartered Institution, it has a great number of members, men of worth and talent—men who are capable of making any Institution respectable.

The Republican Weaver.

This is a bird of India and South Africa which lives in communities, sometimes to the num- of one thousand. Their villages or towns, for such they really are, are constructed with a beautiful regularity, there being many entrances to them, each of which forms a street, having rows of nests on each side, at about two inches distance from one another. The nests are constructed with great skill. Year by year the birds add to the size of their town, until the trees at length break down under the weight, then a new site for a settlement is sought.

Blackbirds in Arkansas.

These destructive birds are annoying the farmers of Arkansas. The Van Buren Intelligencer states that an immense and unusual number have invaded that part of the country, destroying the young corn so effectively that many farmers are compelled to keep a hand in the field with a gun to fright them off. When a flock lights on a field, it is almost destroyed at one sweep. Many fields of young corn have been entirely destroyed by these birds, and the owners have been compelled to plant over again.

Letters.

Scotland, with but 2,628,957 inhabitains, and no commercial centre, no political metropolis, and but little foreign commerce, sends 38,669,169 letters in a year.

A Snake Fight.

I had often heard that the King Snake would kill all other kinds of snakes, but never saw it verified until last Sabbath morning.—While riding to church I discovered a King and a high land Moccasin Snake, each about five feet in length, engaged in a fight; the King Snake was twisted around the other about midway his length, three times, and had the Moccasin's mouth in his, and seemed to be biting and pulling as though he wished to twist his head off. There was some blood running down from the Moccasin's head, and it was perfectly motionless and seemed to be dead. My presence did not disturb them. From this time on I kill no more King Snakes. I presume all Southerners know what is called the King Snake, he is black and covered with small yellow specks. Yours, E. J. C.

Centreville, Miss.

The Mississippi River.

The Mississippi drains an area of 300,000 square miles; and the total amount of water discharged per annum in cubic feet is 8,092,-118,940,000. The amount of sedimentary matter in the Mississippi water is estimated at about one twelve hundredth part, by measure, of the whole volume discharged per annum; and since the alluvia deposits in the delta are estimated to have been wholly deposited by the Mississippi and its tributaries, the least possible time upon these hypotheses, required for the deposition of the delta would be 13,648 years. The water discharged in the same time would fill a sea 850 miles square, and one mile deep.

Singular Trance.

A young woman named Ann Cramer, living near Bristol, England, has been in a trance for nearly 13 years. She has taken no solid food during that period, and all the nourishment which she has received has been liquids administered by mechanical means. She is 25 years of age, and has been visited by a great number of medical gentlemen, who, however, hold out no inducement of her recovery.

Iron Furnaces in Scotland.

We learn by the North British Daily Mail, that there are as many furnaces now standing still in Lanarkshire as there are in Pennsylvania, but not from the same cause—a strike for wages being the cause of the cessation in Scotland. Out of 55 furnaces there are 33 idle, and the reduction in the yield of pig iron is about 4,000 tons weekly. The consequence is that prices are beginning to get up.

The Way to Beg.

It is often easier to obtain favors from the pride than the charities of men. A shrewd preacher, after an eloquent charity sermon, said to his hearers: "I am afraid from the sympathy displayed in your countenance, that you may give too much. I caution, you therefore, that you should be just before you are generous; and wish you to understand, that we desire no one who cannot pay his debts to put anything in the plate." The collection was a rousing one.

Clear as Mud.

Transcendentalism is the spiritual cognoscence of phisiological irrefragability, connected with conscientient ademption of incolumbient, spiritual, etherealized contention subultory connection.

Specimens of Australin gold, mixed with the same *quartzoes detrituts* which accompanies the metal in other auriferous districts, have recently been received in England.

The Ottoman goverment have dispatched an admiral and about fifty engineers, officers, and ship-builders to Bussorah, to make a dock, build ships, and launch a fleet in the Gulf of Persia.

The Plymouth Town-Council, Eng., are about to lay down a quantity of glass pipes, jointed with gutta percha, as an experiment, for the conveyance of water.

Pavements of broken asphalite rock, dipped in mineral tar oil, have been adopted in Paris. The new material gives great facility of traction, absence of noise, economy, and salubrity.

An Introduction to the Water Cure.

By T. L. Nichols, M. D., published by Fowlers & Wells, Clinton Hall. Price 12½ cents. These enterprising publishers are continually illuminating the public mind with new and interesting theories in relation to the efficacy of water as applied to the eradication of disease, and any one who reads the digest of cases cured under this treatment, cannot, without disputing the authority, deny that a close application of cold water will invariably effect a radical cure of almost the entire catalogue of ills to which human flesh is heir to. We have no objection to any system of practice which tends to alleviate suffering from disease, much less a system so simple as the water cure. It is difficult however to overthrow the "regular's" by any milk and water theories, such as have from time to time sprung into a sickly existence by newspaper puffs or eloquent recommendations of one hundred physicians, a few old women, combined with testimonials of character from ex-Aldermen and Justices of the Peace. There may be, and really is, virtue in the free use of pure water, and no subject can be more important than cleanliness, every person should bathe summer and winter, especially in crowded cities, where every exhalation of breath carries into the lungs a greater or less quantity of fœtid air. Bathing keeps the pores of the body well open for the passing away of unhealthy matter.

After all, people sicken and die, and so far as our observations extend, the doctrines of Hippocrates, Galen, and their successors, are more to be relied upon, as a general thing, in severe cases, than all the pill-box doctors, Graefenberg theories, *a la* Presnitz, clairvoyance, chrono-thermalism, Hahnemannism, and all other isms combined. If disease does not increase more in proportion to the population than formerly, the new theories may not be disadvantageous to the public health, only so far as the patient places reliance upon a remedy to the exclusion of one of more virtue, and thereby pay the penalty of their credulity.

The work in question, like most of Fowlers & Wells' publications, is well written and clearly printed upon good paper.

The French at Rome.

The unfortunate expedition to Rome appears to have cost the French army a greater loss from fever than on the field of battle From official returns, just published, it appears that no less than 14,848 soldiers were attacked by the marsh fever of Rome, and that 781 of those attacked died. The wretched condition of the soldiers, who, for several months, were allowed to remain without either bed or covering, appears to have been the chief cause of the prevalence of fever to so great an extent. At one period more than one-eight of the whole army was in hospital, and the average mortality was exactly five per cent. The fevers were of the same kind as those which prevail amongst the French troops in Africa; but it is worthy of remark that miasmatic fever is daily becoming less frequent in Africa, from the attention to drainage, &c., whereas to all human appearance, it will never disappear from the Campagna Romana under the fostering care of the church.

Works on Science and Art.

Dictonary of Mechanics, Engine Work and Engineering.—Part 10 of this work, contains articles on Electric Light, Electro Metallurgy, Electricity, Ransom Cook's Electro Magnetic Ore Separator, which appeared in Vol. 4, Sci. Am.; Elevators, Embossing Machines and Engine Work. It is a good number. Published by Messrs. D. Appleton & Co., New York.

Iconographic Encyclopedia.—Part 8 of this splendid work is now issued by the enterprising publisher, Rudolph Garrigue, No. 2 Barclay street. It contains 20 steel plate engravings of maps, and 80 pages of letter press. This work is very neatly executed. It is a copy from the German, or it could not be got up here for three times the money. The plates have many German names, but they all explained in the letter press.

The Cuba expedition has performed the masterly act of conquering Cardenas, on the coast. The booty gained was three boxes cigars.

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Philosophy of Mechanics.

Being an answer to a series of articles published in the Scientific American, commencing on page 67, termed "Important Discovery that may lead to improvements of great value."

No. 1.

My object is not that of a controversialist, but simply a desire to correct errors, and to do this fairly it will be necessary to quote at considerable length, for the author of the articles referred to, reasons with great plausability, and sometimes with great force, and is capable of doing a great deal of good or mischief according as he is on the right or wrong side. The student of the science of *mechanics* will not go unrewarded, and the mechanical philosopher may derive some pleasure in walking along with us through our investigation.

The author of the articles referred to introduces his subject with a letter from one whom he terms "one of the most scientific men in the world," to whom he had submitted his theory. With all respect for his judgment, I doubt the correctness of that *scientific* gentleman's qualities, or he would have pointed out the errors of this *new discovery*. This much is said by way of introducing the subject; and now for pointing out the errors by commenting on the main points.

The author of the said important discovery states, page 67, that "*all* mankind and the most learned and scientific men of the age, for want of not understanding the subject fully, greatly retarded the march of onward improvement, and prevented the use of steam on the ocean long before it was." Again he says, "the important step of the use of steam on the ocean was kept back from a doubt relative to the speed of vessels. It is well known that that important step was kept back by a doubt on that point—a doubt which could not have existed if the speed of steamers had been one half greater than it then was."

This is a new discovery, indeed, but it has no foundation in fact, but before we can know let us hear what the error is: he says, it "consists in not fully understanding the principle by which a carpenter drives a nail into a piece of wood—the power that demolishes walls by cannon balls, and which carries balls aloft to the clouds, and to which science gives the name of momentum." It will be news to almost every mechanic to know that ocean steam navigation was kept back for want of a knowledge of the principle of driving a nail into a board. With respect to the term *momentum*, he is correct, so far as it relates to the amount of force in a moving body, but not the force that moves the body, he therefore confounds the question, for there is a distinction between the force exerted by the carpenter in driving a nail and that of the ball that demolishes a wall. The hammer has momentum, so has the ball, but the powder is the force in the one case and the muscles of the arm is the other—the effect in both cases is produced by secondary causes. This may be called quibbling on terms, but mathematical science commences at a point, and takes cognizance of every distinction, and the man who overlooks a *point*, is sure to have a broken line of argument. But the author commits a far greater mistake in the following:—"*this principle*," again he says, "is that which keeps the string of a sling firmly extended, and keeps the planets from falling into the sun, and which, in these latter cases, science calls it centrifugal force, and about which philosophers write and speak as if it was a distinct property of matter, and about which they would have known nothing had they never seen circular motion, [how could they do otherwise,] whereas, if they had fully understood the principle we speak of, they would have been able to estimate with exactness all its power, even if circular motion had never been known by them." This *discovery of great importance* must be an extraordinary one—something surpassing a clairvoyant state, when it can give such capacity for discovering the amount of circular force, without knowing any thing about it. Well, what is it? He tells us that it is simply this, *that matter resists a change of state, whether of rest or of motion, and the amount of resistance is in proportion to the amount of change.* This proposition he says "explains all the phenomena of what philosophers treat of as the laws of momentum and central forces, and is capable of explaining far more than is to be found from all the explanations of Nicholson's Encyclopedia." This reported new discovery will do no such thing. It will explain the amount of momentum but not the laws of central forces, for a body when moved out of a state of rest will not move in a circular path, unless it is acted upon by some foreign force to divert it from a straight line. Let us take the case of a cannon ball shot aloft to the clouds. Here is a ball weighing 1 lb. shot up vertically by one ounce of powder. This ball will ascend about a mile, and descend nearly in a straight line to the earth. Now if the theory of matter resisting a state of change can explain the laws of central forces, how can it account for the difference between a ball shot vertically and the stone moving round in a sling. If he means the force required to propel a body through a given space in a given time, then he should not confound a question of the direction of motion with motion itself; and there never has been a doubt among philosophers about the method of estimating the amount of the motion of bodies since the famous dispute between Newton and Leibnitz was settled. It is very easy for some people to suppose how things might have been discovered, after they have been discovered, but the most wonderful discoveries are those which have never been discovered, and that is the case with the one we are commenting on, for it cannot explain all the phenomena he would have us believe it could, but with a little addition to it, there can be no doubt but it would, and this addition happens to be somewhat old, but none the worse for that, and it is therefore worth quoting to show that this important discovery, with the addition to make it correct, is nearly a century old.

The immortal Euler, in one of his letters dated 4th Nov., 1760, on the laws of motion and rest, says, 1st, "*A body once at rest will remain eternally at rest*, unless it be put in motion by some *external foreign* cause. 2nd, A body once put in motion will preserve it eternally in the same direction and with the same velocity, or will proceed with a uniform motion in a straight line, unless it be disturbed by some external or foreign cause. In these two propositions consists the foundation of the whole science of motion called Mechanics." The difference between Euler and the author of the articles referred to consists in this, that Euler knew all that *he* did about 90 years ago, and something more, for Euler was not only acquainted with that property of matter which resists a change of state, but he also knew that it had a property which also resisted a change of direction, and this explains the difference between a cannon ball moving in a straight line, and the stone in the sling describing a circle—cut the string of the latter and the stone will fly off in a straight line. It seems that circular motion was always a mystery to him, but since his important discovery he now can account for the splitting of grindstones, &c., moving at a high velocity; but if circular motion has heretofore been a mystery to him, it has not to others. He produces one example to illustrate his *new* discovery, by placing a ball on a horizontal revolving plane, and giving it two motions, one at the double velocity, so as to render more plain Nicholson's 9th proposition of central forces, but this sort of reasoning is opposed to his discovery. He had no business to use a revolving plane to illustrate his proposition, for if his theory is correct, that a thing at rest will remain at rest, or a thing in motion resist rest—a change of state, then he should have proven his proposition, by one moving body, and one body at rest. It is not fair to take a revolving table with a ball on it to use for his purpose, for in it the central forces are in active operation and he could not call them into existence by *his* theory, without rendering the splendid discovery of Newton a fiction—something which will take more than one important discovery to accomplish, of the kind, at least set forth above.

*

(To be Continued.)

Red Oxide of Zinc and Franklinite.

The opening of the mines containing these remarkable ores, found in no other part of the world, was noticed in a recent number of our paper, and as the enterprize is justly regarded as one of great national importance, in furnishing the mechanic arts with new and superior material to work upon, and developing the mineral riches of the country, we lay before our readers an interesting description, abbreviated from the Newark Daily Advertiser:—

"The mines of these valuable metals in Sussex County in our own State are believed to be richer and more valuable than any other similar deposit yet revealed, and we are happy to say that they are at length likely to be made available to the country through the enterprize of the New Jersey Exploring & Mining Co.—This association is now successfully working the Stirling Hill Mine—which is situated on the westerly side of the Wallkill, some 5 miles from Sparta, and we have taken the proper means to enable us to give some account of it.

A narrow belt of white chrystalline limetone is found commencing near the New York state line, which extends southerly along the valley of the Wallkill about 25 miles, and terminates near Waterloo in the southerly part of Sussex county. It is bounded on each side by a blue limestone formation, which appears to have been originally one, as the blending is so gradual that the line of union is designated with difficulty. The white limestone is supposed to owe its color and chrystaline structure to igneous agency, and is the gangue or matrix of many valuable minerals, and is the repository of all the red zinc ores and veins of Franklinite that have ever been discovered.—The range of the limestone is from the north- to south east, having a north-easterly dip: the veins of red zinc and Franklinite, and the Franklinite, or black vein, are parallel, and are only seperated by a thin layer of brown ferrguinous limestone, varying from one to five inches in thickness.

The outcropping of the veins on Stirling Hill are on its easterly face about 40 rods west of the Walkill, and 100 feet above the level of its bed. No regular mining operations have ever been attempted here until within the last two months. A small gallery was cut through the lime stone to the vein about fifty feet below its outcrop a few years since, under the direction of a scientific engineer from the "School of Mines," sent out by a French company to examine this mine. Fras. Alger Esq., caused the rubbish to be removed, exposing the out-crop for about 600 feet, and several smalll openings at different points, but very little ore has ever been removed except for purposes of experiment, and to obtain cabinet specimens.

The New Jersey Exploring Mining Company commenced mining operations on this Hill at the southerly point uncovered by Mr. Alger, by stripping the limestone from the face of the vein to a level about 50 feet below the gallery before mentioned. The limestone and rubbish thus removed, has served the purpose of forming a platform for breaking and piling on, and also a serviceable material for making a road. The vein is now exposed at a much lower point than we have hitherto been able to examine it. This demonstrates two important facts in an economical view—first, that the vein increases rather than diminishes in thickness as it descends: secondly, that it assumes a more vertical position, and furnishes indications that in descending there will be found a more perfect separation of the zinc from the Franklinite. Nearly 800 tons have been mined and broken this Spring, and are ready for transportation. With the force now working, from one to three hundred tons can be mined every week through the season. Foliated or Lamellar zinc ore, which has hitherto been considered a rare production, and highly prized for cabinet collections, is becoming more abundant at the depth now worked, and a mass weighing over 1200 pounds, seven tenths of which is foliated, will be on its way to Newark next week. It is well worthy of a place in the national collection of the Smithonian Institute at Washington.

The vein of red zinc and Franklinite will average from present appearances, to the depth now open, about five feet in thickness: that of the parallel vein of Franklinite cannot be as accurately estimated, but from surface indications it cannot be estimated at less than 20 feet.

Mr. Alger, in the article referred to, made what appears to have been a very careful estimate of the quantity of zinc ore above water level in the 600 feet of vein he caused to be uncovered. Estimating its known specific gravity to give 340 lbs. per cubic foot, he found the amount to be 40,800,000 lbs: he estimated the thickness of the vein at 4 feet. We believe its average will exceed 5 feet, which would give 51,000,000 lbs. of zinc on allowing one-half the mass of the vein to be chrystals of Franklinite. The Franklinite vein, for the same length and depth by 20 feet wide, would weigh 408,000,000 lbs.—one-third of which would be oxide of zinc, amounting to 136,000,000 lbs. Add the amount of zinc vein, 51,000,000, and we have the enormous amount of 187,000,000 lbs. of oxide of zinc that will yield 81 per cent., or 151,470,000 lbs. metallic zinc.—This estimate is only for a small extent of 600 feet of vein, 100 in depth.

What coming generations may find that may werk these vertical veins—using machinery to drain the mines and raise the ore to the surface after the ore above water level shall have become exhausted—is a subject not requiring investigation at this time. Enormous as the amount may already appear from the above figures to be contained in the exposed and measured part of the zinc mines of Sterling Hill, recent discoveries have demonstrated it to be but a small part of the zinc and Franklinite at that place."

We understand that the extensive works of the Company, at Newark, N. J., for the reduction of the ores and the manufacture of zinc, and its oxide for paint, and iron, are rapidly approaching completion, and that these articles will soon be in the market.

Depths of the European and Open Seas.

In the neighborhood of the continents the seas are often shallow; thus the Baltic sea has depth of only 120 feet between the coasts of Germany and those of Sweden. The Adriatic, between Venice and Trieste, has depth of only 130 feet. Between France and England the greatest depth does not exceed 300 feet, while south-west of Ireland it suddenly sinks to 2000 feet. The seas in south of Europe are much deeper than the preceding. The western basin of the Mediterranean seems to be very deep. In the narrowest parts of the straits of Gibraltar it is not more than 1000 feet below the surface. A little further towards the east the depth falls to 3000. On the north-west of Sardinia bottom has not been found at the depth of nearly 5000 feet. With respect to the open seas, their depths are little known. About 250 miles south of Nantucket the lead has been sunk to 7800. In north latitude, at 76 deg. Captain Ross has exceeded 6000 feet in Baffin's Bay. But the most astonishing depths are found in the Southern Atlantic; west of the Cape of Good Hope 16000 feet have been found, and the plummet has not found bottom at 27000 feet west of St. Helena. Doctor Young, relying upon the theory of the tides, considered himself justified in assigning about 15000 to the Atlantic, and about 20,000 to the Pacific.

Lake of Pitch.

In the Island of Trinidad, there is a lake of pitch about half a mile long and one fourth wide. It is a dreary looking place surrounded by a shrubbery of the most beautiful flowers. The pitch is dug out of the lake, boiled and left to harden, then shipped for mastic.—The pitch is dug no lower than 12 inches, and however much is taken out one day, the pit is always filled up in the morning. The supply seems to be inexhaustable.

We understand that the chief portion of the late arrivals of silver in England has been purchased for transmission to Russia, in connection with the shipment of gold about to take place; but this is not correct—silver, at the present relative price of that metal in London and St. Petersburgh, forming the best remittance.

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New Inventions.

New Kind of Cotton Bagging.

The Southern Whig says, "We understand that Col. Mosery, a native of this State, and for many years a resident of Wilkes county, but now an enterprising citizen of Mississippi, has discovered a process by which a very superior article of Cotton Bagging can be made of the long moss so abundant throughout the Southern States. We learn that he is about securing a patent for his discovery, and that he has just returned from the North, where he as purchased machinery for a Bagging Factory which he is about to establish at or near Jackson, Mississippi. If this experiment should succeed as well as the discoverer of the new process anticipates, it will probably effect a revolution in the manufacture of this article, which enters so largely into the annual consumption of the planters of the South—as doubtless bagging manufactured of this material can be furnished much lower, while it is said to be far superior to any now in use."

Improvement in Pitchforks.

Mr. Alinzor Clark of Southfield, Richmond Co., Staten Island, has invented an improvement on pitchforks which is well worthy of patronage and for which he has taken measures to secure a patent. The improvement consists in the manner by which he can transform the fork from one of two prongs, to three prongs, so as to make it more suitable for forking and and pitching, both long and short hay, &c., as may be desired. The transforming of the prongs can be performed in a second and either as a the or three prongs, are retained firmly in their places. We like to see improvements in agricultural implements—-agriculture is the right hand of our national prosperity.

New Pumping Apparatus.

We see it stated in some of our exchanges that Mr. W. G. Johnson of St. Georges, Deleware, has made some valuable improvements in apparatus for pumping water and has in operation an engine with a cylinder four inches in diameter, and twelve inches stroke, with which he is working eight pumps, each fifteen an a half inches in diameter of bore, and twelve inches of stroke, making sixty-four strokes per minute, and discharging the water nineteen feet high.

Wilson's Stone Cutting Machine.

In our article on Wilson's Stone Cutting Machine, last week, Messrs. Shelton & Flagg were mentioned as the proprietors of the patent. This was an error; Messrs. Shelton, Flagg & Andrews, of No. 12 Wall street, Counsellors and Attorneys, are the Attorneys for the proprietors, and are their agents in this city. There was also an error in the name of the firm owning the machines now at work in New York—the true name is Sherman & Houdayer.

New Iron Bridge at Washington.

Mr. Rider of this city has put up one of his iron Bridges over the Creek, at Washington. It has a span of 110 feet; it has two carriage ways and two foot paths, and presents a very graceful appearance. It was tested as to capacity, last week, by Mr. Rider in presence of President Taylor, Mr. Ewing of the Home Department and the Mayors and Councils of Washington and Georgetown.

New Carriage Step for Stages.

Some of our omnibuses have got up a new carriage step, which is thrust out when the door opens, and springs in when the door closes. This is done by the driver pressing with his foot upon a spring. This step will prevent the boys from riding for nothing. We called attention to a step of this kind in volume 4, and are glad to see its introduction.

Silk Manufactory in Massachusetts.

M. Vogel, a Swiss gentleman and the inventor of the heddle machine, is about to start a silk factory near Chelsea, Mass., to make ribbons, vestings and all kinds of figured silk work.

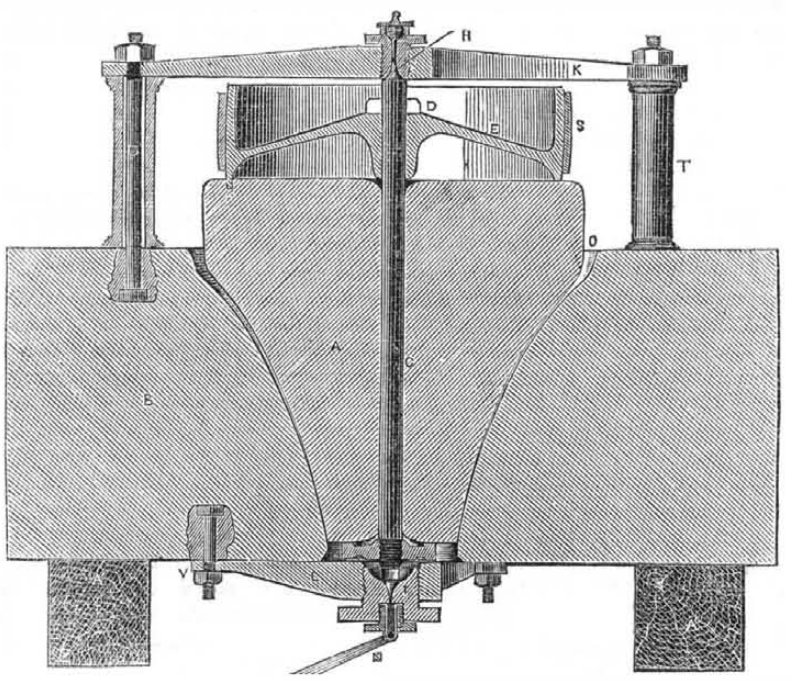
Alum and Muriate of Soda are found in considerable quantities in Columbia and Lincoln counties, Georgia. The muriate of soda is salt.

SCHIELS' ANTI-FRICTION CURVE.--Continued from Page 1.

Having presented on the front page, fig. 4, a section of a regulator of a locomotive engine, it will be understood that the same curve is applicable to all revolving valves, (perhaps substitutes for slide valves,) revolving joints in pipes, spindles of lathes, railway turn-tables, footsteps of upright shafts, and numerous other applications, which will strike the mind of the mechanician at once. The friction of this curve in its bearing, is at a minimum, and may be expressed as follows :— $\frac{8GLNP}{C(D^2-d^2)}$ where P is equal to the whole pressure, the rubbing surfaces have to bear in the direction of their axis; D the diameter of the larger part; d the diameter of the smaller part; L length of generating curve; G the distance of the centre of gravity of the curve from the axis; C the co-efficients of friction, and N the number of revolutions. The curve is one of great grace, reminding us of Hogarth's "bounding line of beauty," and is most accurately drawn by the apparatus, fig. 1, which is constructed by Mr. Schiele.

Figure 5 is an ingenious application of this principle to the grinding surfaces of Mill Stones, being a vertical section, and shows beautifully how the gradual variation of the

Figure 5.



curvature in relation to the increasing distance of the parts from the centre of motion, equalizes the rubbing pressure in the most perfect manner. The lower step at I is supposed to bear about equal pressure from the side and from below, in the direction of its axis and the inclination of its thicker part is at B, fig. 1. For the construction of the rubbing surfaces of mill stones, it is taken at an inclination of about 45°, as at B, fig. 1, for the larger diameter; this being considered sufficient for the grain to slide down. The application of the curve is also shown in fig. 5, to footsteps. A is the upper or inner running mill stone; B is the lower or side stationary one; C is the spindle secured to the stone by a nut, D. E is the pulley. The pivots run in bearings, H I, which can be raised by securing them in the frame, K L. These frames are fastened to the larger stone by nuts, T V, screwing on bolts, U. An oil cup is in communication with the lower step, to lubricate it. The oil gathers in the step at I, and runs off in the small conduit, N. O is a canal round the stone, B, for receiving the grain. The space between the rubbing surfaces adjoining the canal opens sufficiently to receive the grain, which gradually descends until it is ground, when it passes off by a spout below, (not attached.) S is the band; *a a* are sills to support the apparatus.

To afford a comparitive test of the effect produced by the new curve, in relation to that of ordinary rubbing surfaces, the inventor formed a variety of frictional contours of equal diameters from the same cast of iron, carefully annealed, and compared each of them separately, under different pressures, in the direction of their axes, with the proposed curve.

Fig. 6, of our engravings, represents a sectional view of the different forms tested; and fig. 7 exhibits the same after wear.

Figure 6.

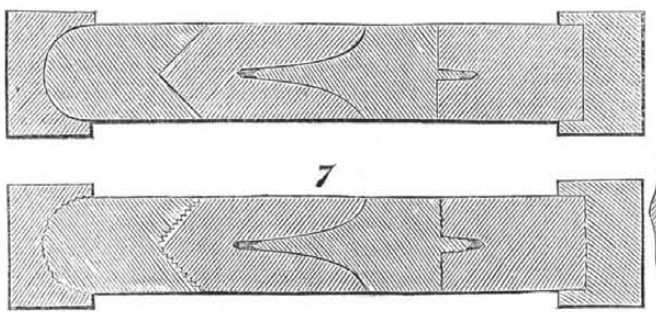
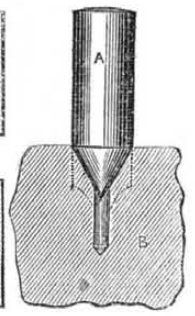


Figure 8.



In some instances, the old forms evidenced a less amount of friction than the new one, but this was for a limited period only at the commencement, as very quickly the destructive wear, increasing towards the centre, caused so much friction that the parts adhered firmly together.

The conformity of this principle with the workings of nature is a circumstance arguing most favourably for the application of the new system; and the following experiment, which any one may easily try, affords the evidence required by the practical man.

Take two pieces of chalk, A and B, fig. 8, A is cylindrical and conically tapered on one end, which is made to fit nicely into B. The centre of the hole in B must be drilled out, and the two pieces rubbed against each other, the rubbing surfaces being cleared occasionally with a soft brush, removing any particles of sand which may scratch one or other of the surfaces. After continuing the movement for a short time, the inclination to the anti-friction curve gradually appears, and the longer the rubbing is continued, the nearer do the surfaces approximate to the contour referred to.—The dotted lines in fig. 8 illustrate what is meant. Mr. Schiele has exhibited the apparatus he has employed, together with the results obtained, to any one who may wish to pass his own judgement upon the idea, as reduced to practice.

Mr. P. R. Mehlgarten, in the employ of the Lowel Machine Shop, Lowell, Mass., is agent for the United States and is enabled to fill all orders through the company and to attend to any communication, post paid, upon business connected with his agency.

Manufactures from the Cocoanut.

"The cocoa manufactures are remarkable for simplicity of the process resorted to, and for the usefulness of the articles produced, in many instances, from materials formerly thrown away as useless. The cocoa nut as it comes from the tree consists—first, of the outer husk, composed of fibres matted and adhering together; secondly, the shell; and, thirdly, the kernel. The manufacturers up to the present time employed only the outer husk and kernel. The natives of India have long used the fibres obtained by rotting the outer husk till the fibres can be seperated by beating the husks.—The fibres are spun into yarn by the native girls and women, by rubbing such fibres between the palm of the hand and the surface of the leg; and in this manner is made the large quantity of Coir yarn brought into that coun- and used for weaving cloths for covering passages and rooms, and also matting for various uses. Notwithstanding this rude mode of spinning the fibres up to the present time no better means have yet been introduced; and the whole of the yarn employed in England try is imported. This, however, may be accounted for by reason of there having been no practical mode of obtaining the fibre in Britain from the husks till very lately. Now, however, that ready means of obtaining the fibres from the husks are known, it is reasonable to expect some better means of spinning will be invented. The husks are beaten to obtain the fibre, which consists of three descriptions:—first, a light elastic fibre suitable for stuffing furniture; secondly, a coarser fibre used for making mats; and thirdly, a strong fibre used for brushes and brooms. The husks are soaked for some time, then subjected to the presure of grooved rollers, and then by successive processes of carding by revolving cylinders armed with bent teeth, the fibres are combed out, the separate descriptions of fires being deposited in different receivers. The uses of these fibres are for making of brushes, brooms, mats, and mattresses. The kernels are dried in the sun, then pounded in mills to extract the oil; but in more modern times the dried kernel has been pressed between mats in powerful presses.—The oil for the most part is sent to England, and was formerly largely employed in the manufacturing of candles. The oil being, when it comes to London, of about the consistency of lard, requires pressing to separate the stearine from the œlaine, and this is done between mats of cocoa nut fibre pressed in powerful presses. The stearine was used for candles at first alone, then in combination with stearic acid of tallow, producing what are called composite candles; and it was the introduction of stearine of cocoa nut, combined with steric acid, which constituted the first step to the great improvement which has taken place in the manufacture of candles. The larger quantities of cocoa nut oil, however, are now exported to France to make soap,—the use of such oil in candle making being now for the most part substituted by palm oil. It has ately been proposed, in Ceylon, to employ the juice of the cocoa nut tree for the making of sugar; it being considered that each tree is capable of producing upwards of one hundred weight per annum, and that an acre of cocoa nut trees, requiring little cultivation, will produce at least twice as much sugar as an acre of sugar cane requiring much more cultivation.

The Austrain goverment has notified that it will pay 20,000 ducats to the person who will construct and deliver the best locomotive for the railway which passes by the Summering, the mountain which separates Styria and the Archduchy of Austria.

Among the passengers by the Avon steamer, from the West Indies, lately, was a negro physician, who visits England to submit to the goverment a plan, founded on scientific experiments, to supersede steam as a propelling power, but which will end in ——.

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Scientific American

NEW YORK, JUNE 1, 1850.

Our Atlantic Steamers.

The Atlantic, the first of the Collins' American Mail Line of Steamships, has made her first voyage across the ocean. She made the passage in thirteen days to Liverpool. Many of her friends stated, when she left New York, that they would feel disappointed if she did not make the trip in ten days. The reason why she made so tedious a voyage is stated to be "the breaking of the valve of one of her air-pumps, and the breaking of a number of her paddles."

We feel not a little regret at her somewhat unfortunate trip, but we had no such ideas of her high speed, as were propagated through the columns of our daily press. It was stated in all our daily papers that she ran at the rate of 18 knots per hour on her trial trip. If this was true, she could make the voyage to Liverpool in eight days. The character of our steam ships has received more injury from the inflated boastings of ignorant commentators than from any other source. We hate rant and cant in essence and principle, and have very little confidence in the prudence or judgment of those who forget the old maxim, "let not him that putteth on his armor boast." We have now but entered into competition with Great Britain for a share of Transatlantic Steam Commerce. She has had the monopoly of it for twelve years, and with her great experience in marine navigation it is not wise to under-estimate her abilities, and over-estimate our own. It is best to look every difficulty in the face and meet it with compressed lips and determined hearts. It is more glory to hear others cheer for us than to cheer for ourselves. Washington never exhibited greater wisdom and magnanimity than when he told his war-worn veterans at Yorktown, not to cheer at their own victory,—"posterity would cheer for them."

We have now four steamships running to Europe. As yet none of them has been so successful as their opponents, the Royal Mail Line. Our steamships have not been so well constructed as a whole. There can be no other reason assigned for our want of greater success, than this. The principal blame is thrown upon our engine builders by the press, but it is not their fault altogether, as the side bags of the Washington can fully testify. We want experience principally, for, until within a few years, there was not a single steamboat in America capable of crossing the Atlantic. Our boats were built for river and lake navigation, and were totally different in build and trim from those adapted for ocean navigation Our opponents have been experienced in marine navigation from the very origin of the art. The rivers of Britain are so short, and the sea coast so extensive, that all their steamboats were built to brave the storms of the Atlantic. From the great speed of our razor-shaped river boats, many, not merely supposed, but asserted, that all we had to do was to launch our sea steamships and drive Uncle John Bull at once from the ocean. With preconceived prejudices, our first steamships were built with engines after a touch of our river craft, but our engineers have wisely adopted the policy in their new engines, of taking those models which experience has proven to be the best, and in a short time we will equal, we do not say surpass, our rivals.

The Pacific left this port on last Saturday, on her first voyage to Liverpool. She looked well and will make the voyage, we think, in about 11 days. All that we have to do to attain and maintain equality on the ocean, is to persevere until success crown our efforts.

The Using of Paint.

It is not an uncommon thing for some paints, especially when exposed to the atmosphere, to rub off like whitewash, after they have been put on for about six or eight months. We have known white paint do this, although both the oil and white lead were said to be good. In respect to white paint, which is most extensively used, there are three things which may be the causes of its inferiority and rubbing off. These are bad oil, bad lead, and too much turpentine. The best linseed oil only should be used, and it should be boiled, but not too long nor at too great a heat. Linseed oil is frequently adulterated with sun-flower oil, which is very inferior to that of linseed.

Sometimes white lead is sold which is very inferior to others, but painters know how to judge between the good and bad. The best can easily be ascertained by painters from the quantity of oil required to give it proper consistency. In mixing paints, there should be no turpentine at all used for outside work (at most the smallest possible quantity) because the turpentine makes a soap of the oil, consequently, it soon will rub off or be washed away by storms, &c. The only benefit of boiling linseed oil is to drive away its moisture, and ammonia, so that the gluten of the oil will form a beautiful skin or varnish, when dry, to protect the lead from the effects of the atmosphere. While turpentine forms a good varnish with resins and gums, its combination with oil is altogether different, forming a soap, hence those who know not this fact, and use too much turpentine with their paints for outside work, may expect to see it disappear before it is very old. The best way to put on white lead for outside work, is to commence with a very thin coat, and let it dry perfectly. It is better to put on four thin coats, one after another, than two thick ones. The labor, to be sure is more expensive, but those who buy their own paint, and use it in the country, will find out that it will be a saving in the end.

In Painting woodwork, the first operation consists in killing the knots, from which the turpentine would otherwise exude and spoil the work. To effect this, the knots are covered with fresh slaked lime which dries up and burns out the turpentine. When this has been on twenty-four hours, it is scraped off, and the knots painted over with a mixture of red and white lead, mixed with glue size. After this they are gone over a second time with red and white lead, mixed with linseed oil.—When dry they must be rubbed perfectly smooth with pumice stone, and the work is ready to receive the priming coat. This is composed of red and white lead, well diluted with linseed oil. The nail holes and other imperfections are then stopped with putty, and the succeeding coats are laid on, the work being rubbed down between each coat, to bring it to an even surface. The first coat after the priming, is mixed with linseed oil and a little turpentine. In laying on the second coat, where the work is not to be finished white, an approach must be made to the required color. The third coat is usually the last, and is made with a base of white lead, mixed with the requisite color, and diluted with one-third of linseed oil to two-thirds of turpentine, for inside.

Painting on stucco, and all other work in which the surface is required to be without gloss, has an additional coat mixed with turpentine only, which, from its drying of one uniform *flat* tint, is called a flatting coat.

If the knots show through the second coat, they must be carefully covered with silver leaf.

Work finished as above described would be technically specified as knotted, primed, painted 3 oils, and flatted.

Flatting is almost indispensible in all delicate interior work, but it is not suited to outside work, as it will not bear exposure to the weather.

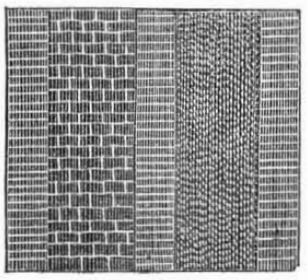
Painting on stucco is primed with boiled linseed oil, and should then receive at least three coats of white lead and oil, and be finished with a flat tint. The great secret of success in painting stucco is that the surface should be perfectly dry; and, as this can hardly be the case in less than two years after the erection of a building, it will always be advisable to finish new work in distemper, which can be washed off whenever the walls are sufficiently dry to receive the permanent decorations.

The Paving of Streets.

As the advantages of good roads through the country are unquestionable, so the benefits of well paved streets in cities are no less apparent. Good roads are an evidence of civilization. The Indian follows the trail of his forefather, and gives evidence of some kindred instinct like the brute, but the civilized man levels the mountain and fills up the morass to make a permanent pathway for the horse and his rider, the carriage and his driver. The importance of good roads was not unknown to the ancients, and to the Carthagenians, a commercial people, is the invention of paved roads traced. From them the Romans learned the art as they did that of shipbuilding. During the reign of Julius Cæsar the Capital was in communication with the chief towns by well paved roads which branched from the seven-hilled city, at one time, to every province of the empire. The Romans introduced their system of roads into Britain, and they were made upon a gigantic scale, with an eye to permanency, it being the common opinion then that the Roman Empire was to endure for ever.

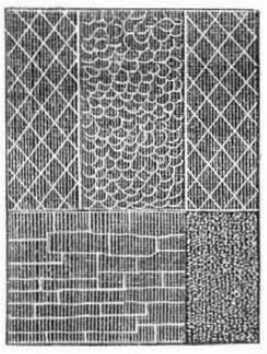
We here present three cuts of different kinds of pavements, to show different kinds of it and to illustrate it, as this is a subject with which many are less acquainted than would be supposed.

Fig. 1.



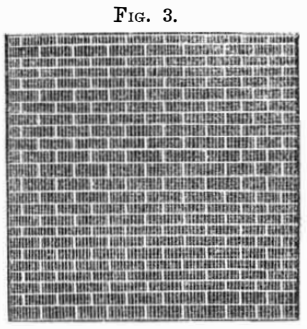
This is a pavement made of large thick flags for the wheel tracks and filled in between with neatly laid small rectangular blocks of trap. The tracks and foot ways are laid in a bed of concrete and cement, made firm and evenly, and the whole surface made slightly convex.

Fig. 2.



This is a pavement called the "Perrine pavement," and is now being laid down in a part of Broadway. The street is excavated to considerable depth, and a tier of broad flag stones laid down first, the seams of which are filled with pitch; above this is laid broken metal and gravel, the pitch being freely used amongst it, and then on the top are laid the diamond block tracks for the wheels, with the horse tracks between, made of cobble stone. There are four tracks on the width of the street, and the whole is gently rounding.

Fig. 3.



This is a pavement made of oblong blocks of trap, each of about 10 inches long and six broad and six deep neatly trimmed. The ground is excavated about 14 inches and a strata of 4 inches gravel mixed with sand and some plaster of Paris is laid down and well beetled and levelled and then sprinkled with water. Then another strata is laid down of the same stuff and treated in the same way, making it slightly convex. On the top of this these oblong blocks are laid in among a bed of sand mixed with ground burnt bricks. These blocks must be accurately laid and well rammed down, and in our opinion will make the best pavement for a business city like New York, where there is an immense amount of ravel.

The idea of paving the streets of modern cities is derived from, and based upon the Roman roads. Many of these are still in perfect repair in Italy, especially in the neighborhood of Rome. The stones are generally of trap rock, of a polyangular shape, of a very large surface, and about fourteen inches deep. They are slightly pyramidial, and set with their broad faces upwards. They are well fitted together, and sometimes laid in cement, though not always. In Naples the blocks are rectangular (mostly square) of about two feet, by two surface, and six inches in thickness, well fitted together, placed diagonally on the street, and laid in a thick bed of Roman cement.—This pavement excels in solidity and evenness, but becomes dangerously smooth, hence it is necessary, from time to time to cut grooves on its surface. The city of Rome is paved with blocks which are parallelograms, of about ten inches square surface. They are laid in a thick bed of cement. In the cities of northern Italy the roads may be called stone railroads, as the tracks for the wheels are broad flat stones, laid with precision, while the tracks for the horses' feet, between the lines, are paved with small stones. This is a good pavement, when well made, and was partially carried out on the great turnpike between the cities of Albany and Schenectady, in New York. None of these kinds of pavements are suitable for such a city as New York, in our opinion.

A great number of different kinds of pavements have been tried in New York city. The cobble stone, or small boulder pavement, is the oldest, and not a bad pavement when well laid down, but this is seldom the case, and one great difficulty in the way of its endurance, is the great variety in the quality of the stones. Wooden blocks were at one time supposed to be the best of all pavements, before their enduring qualities were tried. The pavement which has got the name of "Russ" in this city, is nothing more nor less than the Neapolitan pavement only its pozoloni bed of concrete for the diagonal blocks, is made in sections. It will soon have to be treated in this city, after it becomes smooth, like the pavement in Naples. This is the only objection to it. but it is a very serious one. The pavement in figure 1 is the best for steep inclines, to allow horses to pull heavy loads up the same, and although not required in such a city as New York, it may be good for some other city. The Perrine pavement is not suitable for streets like Broadway, where the carriages and omnibusses will be continually crossing the tracks, and it will be expensive for repairs, because there is so much street lifting for gas pipes, and common sewers. The Russ and Perrine pavements are solid and lasting, but we must look to a pavement that will be enduring, easily repaired, easily laid down, and that will obviate the surface difficulties of the two pavements mentioned, such a pavement is figure 3. It is smooth, yet presents an excellent foot hold. It is enduring, can be laid down in one half the time of the Russ, and one-twentieth of the time of the Perrine. It will allow easy access to drains and pipes, and its substrata will be impermeable to water, and firm—qualities desired for a good pavement. We commend it to the attention of our City Inspectors and paving engineers.

Reform of the Patent Laws.

The Bill for the Reform of the Patent Laws which has been considerably discussed in the Senate, and amended, has been recommitted to the committee on Patents. Whether it will become a law this session, or not, it is impossible to tell at present.

Thanks Due.

We are undebted to Gregory's Express for the prompt delivery of a package of gold from San Francisco on the afternoon of the arrival of the Crescent City. The business at this end of the route is under the efficient management of Mr. J. C. Thomson, office 149 Pearl st., N. Y.

We are indebted to several senators and repsentatievs in Congress for valuable public documents.

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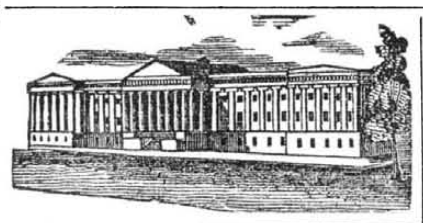

☞ Our weekly List of Patents and Designs contains every new Patent, Re-issue and Design emanating from the Department, and is prepared officially, expressly for the Scientific American, and for no other paper in the city, consequently other journals are obliged to wait the issue of the "Sci. Am." in order to profit by the expense to which we are subject, and of course must be one week behind. Those publishers who copy from this department in our columns, will, in justice to us, give proper credit for the same.

LIST OF PATENT CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending May 21, 1850.

To Chas. Baeder, of New York, N. Y., for improvement in machines for polishing raw hide whips.

I claim the before described method of grinding, smoothing and polishing raw hide whips, in the manner and for the purpose set forth, that is to say, by the combination of the endless revolving belts, between which the rough raw hide whip is placed, the suspended frame containing the upper endless belt being arranged and operated in the manner and for the purpose set forth.

To John Bevin, of New York, N. Y., for improved Arch Girder.

I claim the method substantially as above described, of strengthening arches by means of metal straps, chains or ropes, which constitute the cords, and pass around the ends and over the arched surfaces thereof without being attached thereto, substantially in the manner and for the purpose specified.

And I also claim providing the arch or beam with rollers at the ends around which the strap, chain or rope passes, substantially as described, when this is combined with a coupling and tightening screw for varying the length of the said strap, chain or rope, substantially in the manner and for the purpose specified.

To J. H. Dakin, of Baton Rouge, La., for improvement in machines for drying bagasse.

I claim the employment of a revolving or rotary inclined flue, as applied and used for drying the bagasse, or compressed sugar cane, or any other green or wet substance intended for fuel, with the heat and flame coming from the furnace under the sugar kettles, or from any furnace whatever, all passing into and through this said inclined or rotary flue, at one and the same time, causing thereby the said bagasse or compressed sugar cane or other said substance intended for fuel, to become dry, and combustible and prepared for fuel the moment that it has passed through said flue, using such machinery or mechanical means as I have herein described, or any other suitable or mechanical means, as I have herein described, or any other suitable mechanical agency, or means that will enable me to carry out and put into practical execution, or use the principle or principles herein set forth, described and claimed, and to obtain the intended objects and results in combination as a whole.

To P. S. Devlan, of Reading, Pa., for arrangement and connection of screw-propellers.

I claim the arrangement of the principal and auxiliary propellers connected by cog gearing, or its equivalent, with that of the water pipes, in the manner and for the purpose herein described.

To J. G. Garretson, of Salem, Iowa, for improvements in hand looms.

I claim the shedding the web by the direct action of the lathe on the treddles, by means of a moveable finger and a finger staff, or any other similar fixtures for the purpose, bearing down the treddle, and thereby producing a shed in the web at the backward vibration of the lathe.

I also claim the combined action of the hand, cam wheel, finger staff and the finger upon the treddles, as above described, for the purpose of shedding the web by the backward vibration of the lathe.

I also claim the combined action of the hand, cam wheel, by the zig-zag groove, lifting side and drivers upon the picker-staff, as above described, for the purpose of throwing the shuttle back and forth alternately at each backward vibration of the lathe, immediately after the shed is produced, the loom to be propelled by hand or other suitable power, all the above parts being substantially as herein described.

To J. Jack, (Assignor to Alfred Bell,) of Nunda, N. Y., for improved wickets for lock-gates.

I claim making and arranging a sliding wicket gate in such manner, that when shut it shall rest upon its seat, and make a light joint, but when moving to or from its closed position, shall be raised from its seat and supported on wheels to diminish the friction, and consequently the expenditure of power required to open or close it; the power for operating it, being applied through a lever, or its equivalent, so as to move the gate very slowly but with great force, until it is started from its seat and the weight thrown upon the friction wheels, and then to act upon it with diminished force, but move it faster until it is fully open, thus counterbalancing, as near as may be, the force and the resistance.

I do not claim the mere counterbalancing of the weight of the gate and the pressure of the water on its upper edge, by means of the pressure of the water acting upon a flange at its lower edge, but I claim placing a flange for this purpose in an inclined position, substantially as described, so that the vena contracta shall not prevent the issuing water from pressing against it.

To E. Jenney, of New Bedford, Mass, for improvement in machinery for sawing staves.

I claim the mode of steadying a long cylinder saw, viz., by means of a shaft and proper connections, at one end of the saw, in combination with a series of friction rollers and their supporting frame, applied outside of the saw and made to bear against the curved surface of the same, and at or near its other or serrated side, substantially as herein described.

To S. Lewis, of Tiffin, Ohio, for improvements in machines for sawing wood.

I claim, 1st, the combination and arrangement of the suspended vibrating feeding lever and rotating forked arm, jointed reaching arm, rack and slide bar, with the self-champing self-adjusting hinged jaws for holding the wood firmly during the operation of sawing, the feeding of the log being effected by means of the rotating forked arm, actuating the feeding lever in the manner for the purpose set forth.

I also claim the combination of the transverse bent lifting arm, and suspended lifting lever with the suspended feeding lever and bent rod, for unlocking the spring dog, and vertical spring catch, as described, by which the feeding lever is engaged with the jointed reaching arm, simultaneously with the ascent of the swinging sash, in the manner and for the purpose set forth.

To J. A. Maynard, of Boston, Mass., for device for discharging ashes from tuyers.

I claim combining with the valve on the end of the discharge pipe, a scraper, substantially as herein described, so that the opening of the valve by the stopping of the blast shall cause the scrapers to act, substantially in the manner and for the purpose specified.

To J. C. Parry, of Pittsburgh, Pa., for method of giving rotary motion to fluid iron in casting rolls.

I claim the combination of the paddle or fan, with two rods, and the frame work and gearing for giving motion to the fan, for the purpose of producing the rotary motion of the iron in casting chilled rolls and similar castings.

To C. Ross, of West Buddick, Ohio., for improvement in feed-regulator for canals.

I claim the combination of the box, the float, sliding valve, segment gate and float, arranged and connected with the mechanism whereby they have an united action, in the manner and for the purposes herein described.

To C. Schiele, of Frankfort, Germany, for improvement in the form of rubbing surfaces for regulating abrasion.

I claim the application of the curved form above described to the rubbing surfaces of cocks or valves, pivots of upright shafts, mill stones, or other parts of machinery in general, where the rubbing surfaces have to bear a pressure in the direction of their axes.

[See engraving in this No.]

To J. M. Seely & W. E. Tomlinson, of Lockport O., for improvement in attachments to mills for preparing corn in the cob for grinding.

We claim the block with its arrangement of incline planes, knives, throats and other devices, which adapt it to operate on corn cobs or ears of corn received from a suitable feeder, and also to be inserted in the eye and be driven by the irons of the runner stone of grinding mills, substantially in the manner and for the purpose described.

We also claim the block arranged as described, in combination with the tubular feeder, arranged substantially in the manner represented and for the purpose described.

To John Shuttleworth of Frankford, Pa., for improvements in Power-looms.

I claim, firstly, the imparting to the heddle bearer a motion simultaneous with, and in opposite direction to, the vertical one of the cylindrical jacquard by an arrangement of supplementary levers and their appendages as herein described, or by mechanism substantially equivalent, the scroll cam or split pulley, being so arrangedas to act alternately as a lock and guide and as a cam.

Secondly, the arrangement and combination, substantially as described and represented, of a segmental shell and stoppers for the ready adjustment of the jacquard to the pattern.

To S. Stevens, (Assignor to G. Forbes), of East Brookfield, Mass., for machine for grinding spiral knives.

I lay no claim to the invention or use of a carriage and stock, such as is used in the machine of Hovey, but I claim the employment and use of the radial arm, and its pivot, or contrivances for supporting the knife, substantially in the manner and connected with the other parts of the mechanism, as herein specified.

To T. C, Theaker, of Mansfield, O., for improvement in apparatus for setting logs in saw mills.

I claim the combination of the alternating cylinder, eccentric sliding dog, cog, notch and spiral spring, with the common vibrating hand lever and concentric circles of teeth, inclining in opposite directions for turning the ratchet wheel on the end of the pinion axle, to the right or to the left for moving the log on the head or tail block, either to the right or left, toward, or from the saw, as before described.

To J. D. White, of Hartford, Conn., for improvement in Lathes for turning.

I claim the central stock head and the chuck and large spur wheel, with the slots in them to allow the axle to be placed in and taken out of the chuck sideways; the large spur wheel being driven by the small spur wheels, the one acting as a compensation gearing to the other, while the slot of the large spur wheel is passing the other spur wheel, in the manner substantially as set forth.

[See engraving of this excellent machine in No. 16, Vol. 4.]

RE-ISSUE.

To W. Emmons, of New York, N. Y., administrator of C. Emmons, deceased, late of New York, N. Y., for improvement in Planing machines. Patented June 27, 1848: reissued May 21, 1850.

1st, I claim the combination of the lever frame, cam wheel, and plane stock, substantially in the manner described, by means of which combination, and the configuration of the cam wheels, substantially as specified, and the plane stock which is made to move in a different and lower line, during its forward stroke, than during its backward stroke, in the manner and for the purposes described.

2nd, The combination and arrangement of the tonguing and grooving planes running with the slides, and the mode of adjusting the same in combination with the surface plane, the cam wheels and levers, substantially in the manner specified, for planing, tonguing and grooving boards and plank at one operation.

And finally, the mode of contracting and expanding the grated bed, in the manner specified, in combination with the tonguing and grooving planes.

DESIGNS.

To D. Root, of Cincinnati, Ohio, or design for stoves.

Farmers and Mechanics.

It is a perverted public sentiment that esteems the industrial pursuits more humble than clerkships and trade, and assigns to the producing classes a lower grade in social life than is awarded to the mercantile portion of the community. The adage of Pope, "Act well your part, there all the honor lies," is a sublime truth. It should nerve the souls of our farmers and mechanics, to assert the dignity of their callings, as the true and only sources of the public wealth, and to maintain their claim to personal respectability. But to do this successfully, they must cultivate their minds and manners, and see to it, that in science and general knowledge, and refinement, they are not behind those whose delicate pursuits have generally secured the pre-eminence in personal adornment and social elevation.—Let them take the illustrious Franklin for their model, and emulate other mechanics who have risen to wealth high public respect, and they will never have occasion to be ashamed of their business or condition in life.

Important Discovery in Turkey.

The Paris *Debats* publishes the following letter from Constantinople:—The Ambassador of France has received information of an important discovery made in the neighborhood of Erzeroum of an extensive bed of coal, specimens of which have been distributed to the consular body in the locality. The province of Erzeroum has hitherto been without combustible materials, and the only fuel of the poor is the dried dung of the cattle. The country, though very productive is excessively cold, and the thermometer descends as low as 25 degrees below zero. The importance of this discovery may be. therefore, readily appreciated, and is, probably, but the prelude to other and more valuable ones, for foreign scientific men have already explored the mountains of that part of Turkey, and have positively stated that the soil, bearing an anology to that of the Altai, in the north of Russia, should contain mines of gold and silver. The Turkish goverment, it is said, intend to have the mine worked by the Governor of the province, who will pay a considerable revenue to the State.

The First American Painter.

At the recent Festival of the New Jersey Historical Society held at Newark, Mr. Whitehead submitted for the inspection of the members a number of sketches and drawings in Pencil and India Ink, by John Watson,—the first Limner, of whose establishment in America we have any knowledge. They were, with only a few exceptions, miniature likenesses of persons living at that time, most of them originals, and some, in pencil, were beautifully finished. Mr. W. read a brief sketch of the artist, embodying what little information tradition has preserved respecting him. He resided in Amboy to which place he came from Scotland in 1715, and died there in 1786.—From the miniatures exhibited, it was evident he had a reputation beyond the limits of the Province, for, besides some of the members of the Schuyler, Johnson and Leslie families of New Jersey;—there were likenesses of Gov. Burnet and Lady, of New York, of Governor Keith of Pa., Gov. Spotteswood of Va., and various personages from the West Indies and elsewhere.

Workingmen's Association for Protection of the Sabbath.

A great meeting of workingmen has been held in the City of Glasgow, Scotland, for the purpose of laboring to bring about measures for the better observance of the Sabbath, and the following is one of the resolutions adopted —Resolved, That we hereby express our decided conviction that the employment of men and animals either in public or private conveyances on the Sabbath day, by persons who are free from bodily infirmity, or who are not under obvious and pressing necessity to do so, is a direct violation of the fourth commandment, and an unjustifiable infringement of the right of both man and beast to rest from toil during the whole of the sacred day; and we are also of opinion that the practice, unhappily so prevalent, of professing christians using their own private carriages or hiring other vehicles on the Sabbath, often on the slightest pretences, is not only contrary to the dictates of religion and humanity, but presents one of the greatest obstacles to the progress of the cause of Sabbath observance amongst all classes of the community.

The town of Belfast, Ireland, seems to be growing very fast indeed, its population has increased since 1831, from something over 50,000 to above 100,000.

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TO CORRESPONDENTS.

"O. P. F., of Me."—We have examined your planing machine and find that a patent could not be secured; it is constructed on the principal of Bentham's, and we have seen a number in operation very like it.

"J. R., of N. Y."—So far as we can judge from your outline drawings, we believe that both of your machines are patentable, but the first one, we believe, to be the most useful. To get a patent, a neat small operative model should be first constructed. The fee of the Patent Office is $30, the rest will be for drawings, &c.

"J. H. O., of N. H."—Your machine could not be patented, for it conflicts with the second claim of the Woodworth Patent.

"J. Y., of Phila."—We do not know anything about the carpet cleaning machine. The old fashioned way of ripping the breadths is the only one we are acquainted with. The only receipt for a cleansing substance is to use soda with the soap. We can give a good receipt for $5.

"C. P. L., of Ga."—So far as the groove and the noddles with friction rollers are concerned, we believe that to be new and patentable, but the substitution of the eccentric, merely, could not be patented; the arrangement although good, is common property.

"H. H., of Vt."—There is a book called "Downing's Cottage Architecture," and another called the "American Architect." You should have both. There is no plaster that will stand the weather on wood. The best cement for cisterns is the first quality of hydraulic cement—no other will do. We prefer a conical or angular roof to any other. If any person purchases Blake's paint, full directions will be given with it. We published the analysis in Vol. 4.

"W. C., of Mass."—We know of no paste that will suit you, but the evil is not in the paste but the moisture, by which the paper is expanded.

"J. A., of N. Y."—We think the same as you about the guage cock. We could not say much about the pump, only that a great number of different feeds have been tried and laid aside for the old plan.

"G. B. S., of Pa."—Gutta Percha was combined by heat with metal plates in 1846, but we find no record of it being united with metal wire before the time you state. We believe that a valid claim on the mere application could not be retained; it is our opinion that it was used in England for telegraph wire before 1847. This we believe, although we cannot put our hand on the information at present, but it was applied to a great number of purposes there, before a pound of it came here, and Mr. Armstrong knows all about it.

"C. B., of Ohio.—The portable coffer dam could not be patented, large tubes have been applied in the same way before.

"J. D., of Pa."—The ley would not be an infringement, if made of soda and as for rain water, that is nothing, other water will do as well, if a little more ley is used. The soda will answer as well.

"L. W. H., of N. Y."—We could send you the claim of Aldrich, if it was to be of any advantage to you. We believe that the two claims would conflict.

"W. R., of Ohio.—We know of no machinery either in use, or that has been used or patented, like yours, for harnesses. We believe it, therefore, to be patentable, but in our opinion, if the trace was fed upon a carrying table, the punching roller would work better.

"E. J. C., of Miss."—You will find something to suit you on another page.

"J. T., of New York."—Your idea of the form of the screw for propelling is correct as a *screw*, and is the only screw of *that kind* that could be used, but it is different from those in use and is not equal to them for compactness and useful effect. The engine, we believe, you will see by examination, to be unequal to the common arrangement—not so direct.

"J. O., of N. Y."—We agree with you in every particular in respect to your changing the motion of the rollers for heavy rolling iron. We understand your idea, we believe, thoroughly.

"A. C. N., of N. Y."—We do not employ travelling agents to solicit subscribers for the Scientific American. Subscribers, bear this in mind.

"W. H. S., of Conn."—All the information we can give you concerning your application is, that the specification, drawings and model have been forwarded to the Patent Office, and the P. O. fees paid. Presume it will come up for examination in its regular turn. Don't worry.

"R. W. D., of N. Y.—We have been compelled to omit the publication of your churn longer than we intended. You will please to bear with the delay, it will appear shortly.

"E. S., of Pa."—If your improvement is a valuable one, you ought to be remunerated for it, and would be no doubt; you are the proper judge of its mercantie value. We cannot advise upon that point.

"N. W. P., of Pa."—Your model has been sent to the Patent Office, and we have written to know the cause of the Commissioner instructing you to furnish one. The fault lies with the office, if any where; we shall know more of it in a few days.

Money received on account of Patent Office business, since May 21th, 1850:—

W. B. B., of Me., $30; C. F. B., of R. I. $55; H. D., of N. H., $20; N. P. D., of N' Y., R. S. T., of Conn., and N. J. S., of N. J., each $30.

Important Notice to us!

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

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Patent Office.

128 FULTON ST.

NOTICE TO INVENTORS.—Inventors and others requiring protection by United States Letters Patent, are informed that all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms. Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

Arrangements have been made with Messrs. Barlow and Payne, Patent Attornies, in London, for procuring Letters Patent in Great Britain and France, with great facility and dispatch.

MUNN & CO.,
128 Fultonstreet, New York.

B. FRANK PALMER—Inventor and manufacturer of "Palmer's Patent Leg," office 376 Chestnut Street, Philadelphia. 300 of these Artificial Limbs are now in use; and reference will be made to persons wearing them in all parts of the country. The "Scott's Legacy Premium," and also the "first premium" of Franklin Institue, Philadelphia; gold and silver medals (first premiums) of the American Institute, New York; M. C. M. Association, Boston, and Maryland Institue, Baltimore, have been awarded to the Inventor. N. B.—The old Establishment for the manufacture of this limb will be continued at Springfield, Mass., by B. F. PALMER & CO. 1*

WOODWORTH'S PATENT PLANING Machine 1850 to '56.—Recent decisions having finally established all the claims of this patent, the subscriber is prepared to dispose of the right to use the machine in the unoccupied Counties and Towns in the State of New York and in Northern Pensylvania. These machinese as made by the subscriber at one operation reduce to a thickness, plane tongue, groove, head and rabbet all kinds of lumber in a better manner and four times as expeditiously and cheaply as such work ean be done by hand or by any other machine. For exclusive or single rights, apply to JOHN GIBSON, Planing Mills, Albany, N. Y. 37 6eow*

STIVEN'S PATENT EPICYLOIDAL Rotary Pump, for forcing and lifting, will be found superior to any other now in use, being capable of forcing water from 20 to 30 feet farther with the same capacity of water and same amount of power applied. As all great fires originate from small fires, no dwellinghouse, factory, or ship should be without one.—This pump is applicable to every purpose a pump can be used for. An inspection is only necessary to satisfy any person of its great utility. Removed to 58 and 60 Vesey st., N. Y. 37 3*

IRON FOUNDERS FACING DUST.—An approved article of Sea Coal Dust to mix with moulding sand; also superior Charcoal Foundry Blacking, Lehigh Blacking, Soapstone and Black Lead Dust, Fire Clay, &c.,—for sale by G. O. ROBERTSON,—City office 4 Liberty Place, (formerly Little Green street), near the Post Office, N. Y. 37 4eow*

FOR SALE—A Marine Railway, at Greenpoint, nearly opposite 24th st., N. Y. city; also 2 houses and 3 lots in North 6th st., between 6th and 7th sts, Williamsburg, L. I.; also 2 small farms; also a lot near the Peck Slip Ferry, in South 7th st., Williamsburg, L. I. The whole or any part of the above property will be sold low. Enquire of FRANCIS O. DORR, 16 John st., N. Y. 1*

THE THIRD ANNUAL EXHIBITION of the Maryland Institute for the promotion of the Mechanic Arts, will be opened at Washington Hall, Baltimore, on Monday the 14th Oct., 1850. The Committee of Arrangements earnestly invite the mechanics and manufacturers throughout the States to exhibit speciments of their handiwork and become competitors for the prizes offered as premiums for superior merit, either in design or execution:—15 gold and 60 silver medals are offered to male and 40 to female contributors. Competent judges will be carefully selected, and increased facilities afforded to all those desiring to present articles for premium or exhibition. For further information, address the Chairman of Com. on Exhibition, Baltimore.

37 5 C. W. BENTLEY, Chairman.

TO STONE CUTTERS, QUARRY OWNERS, and others—The North American Stone Dressing Co., capital $168,000, are the owners of Wilson's Patent for Dressing Stone, and have established an agency in the city of New York. They are authorized to engage in quarrying stone to any extent and will entertain proposals either for purchase of the right to run machines under said invention, or for capital to aid in opening quarries on a large scale. Four machines are now in successful operation in N. Y. city, where they can be seen dressing stone of every degree of hardness, giving perfectly true surfaces and corners, and with a simplicity, efficiency and rapidity which will insure a highly profitable result to all who shall secure rights. Application can be made to

SHELTON, FLAGG & ANDREWS, Attorneys to the N. A. S. D. Co., 12 Wall st., N. Y. 36 4*

IMPROVED FILTERERS.—Fessenden's Patent Pocket Filtering Tube. This is one of the most complete articles ever offered to the public, and is especially adapted to the use of travellers, by sea or land; it being light and compact, and the water being filtered by the very act of drinking. This filter having been duly patented, all persons are hereby cautioned against purchasing or using filters intended or calculated to infringe upon the rights of the patentee.

Fessenden's Division Filter.—This is the most perfect and scientific pressure filter now in use; it is more durable, more easily and thoroughly cleansed, and purifies the water more completely than any thing of the kind ever before invented. The above mentioned filters are for sale at the store of D. H. Butts & Co., 15 Canal st.; Horace H. Day, 23 Cortlandt street, and E. Bartlett, 31 Park Row, where purchasers are invited to examine them. Orders left with D. H. Butts & Co. promptly attended to. 36 4*

NEW STYLE AND IMPROVED SLIDE LATHE.—SCRANTON & PARSHLY, New Haven, Conn., will sell the best slide Lathe for $150 to $200 less than ever before sold. They are built in the most substantial manner—the heads geared and arbors large and of the best cast steel; the slide rest is held to the bed by guides, fed by a screw 2 in. diameter, and feeds from 80 to the in. to 5 1-2 in. pitch, working several hundred different pitch threads within these extremes. Besides the regular lathe feed it has the facing up feed. It is admirably adapted for holding and boring boxes, cylinders and turning and cutting screws. One extra large size face plate, centre rest and reversing pullies go with each lathe. The 12 ft. lathe weighs 4000 lbs. turning 8 ft. 5 in., price $450. The 15 ft. 7 in lathes 4500 lbs., turning 12 feet, $500, swings 26 in. For further particulars address as above, (p. p.) Other lathes for sale as heretofore. 34tf

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MACHINE BANDS, RUBBER HOSE, &c.—After 20 years devoted to the manufacture of India Rubber, the undersigned feels confident of his thorough practical knowledge of the quality of goods in his line. The three factories now owned and operated by him, turn out large quantities of all kinds and styles of rubber goods in use, mostly vulcanized rubber. Orders for railroads, factories and merchants executed with intelligent regard to wants and best interest of the customer. Warehouse 23 Courtland st., N. Y.; 1 factory at Great Barrington, Mass., with whole flow of Housatonic river for power; 1 at New Brunswick, N. J., by steam power; 1 at Piscataway, N. J., water power. These 3 factories embrace machinery and apparatus costing over $50,000—enabling the owner to execute orders with more promptness than any other establishment in the United States.

33 10* HORACE H. DAY.

UNITED STATES RAILROAD GUIDE and Steamboat Journal: a monthly publication, containing official time advertisements, and tables of all the R. R. Co.'s; stations, distances, fares, time of travelling—with all the principal steamboat and stage lines in the country; also, hotels, mails, postage, almanac, &c. The Guide Journal presents stronger claims to public patronage, and possesses superior advantages over all others of a similar nature. Dexter & Bro., General Agents. Sold by all News Dealers, and on all the railroad and steamboat stations throughout the United States. Single copies 12 1-2 cents; per hundred, $7. Yearly subscription $1,25.

Publication Office 43 Ann st., N. Y.
GEO. R. HOLBROOK & CO., Publishers.
35 4*

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by

QUARTERMAN & SON,
36 3m Painters and Chemists

WOOD'S PATENT SHINGLE MACHINES—These excellent machines, illustrated and described in No. 23, Vol. 5, Scientific American, are offered for sale in Town, County and State Rights, or by single machines. There are three sizes, the first cuts an 18 inch shingle, price, $100; 2nd cuts 24 inch, price $110; 3rd, 28 inch, $120. Orders addressed to J. D. Johnson, Easton, Conn., or to Munn & Co., "Sci. Am." Office, will meet prompt attention. 36 tf

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WOODWORTH'S PLANING MACHINE—For sale, the right to use this justly celebrated labor-saving machine in the following States, viz. Pennsylvania and Virginia west of the Allegheny Mountains, Ohio, Indiana, Kentucky, Tennessee, Wisconsin, Iowa, Missouri, Arkansas, Texas, Louisiana, Florida, Georgia, Alabama and Mississippi. For particulars apply to Elisha Bloomer, 304 Broadway, or to E. P. Norton, Esq., Cincinnati, Ohio. 34 5*

IMPORTANT INVENTION.—GURLEY'S beautiful and unique machine for gumming saws, noticed in No. 50, Vol. 4, Scientific American, is now offered to the public as a most important desideratum for saw manufacturers and all who use saws, as they can gum the teeth with very little trouble.—Orders addressed to G. A. KIRTLAND, No. 205 South street, (p. p.), will meet prompt attention. 36 tf

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VENTILATION.—The Subscriber being desirous of making arrangements for the extension of a system of Ventilation, for which he has lately obtained Patents in the United States and Canada, as widely as possible, would be glad to hear of persons in the United States who would undertake its management in such sections and localities as might be agreed upon, especially New York and Boston. The whole operation is natural or spontaneous, and whilst it thoroughly ventilates it also, by the same operation in cold weather, warms the building to which it is applied—floors and all—and with an economy in fuel, far beyond any other means in use. It may be applied to buildings already erected, and cheaper than the present pernicious hot-air system, but if a good dwelling house be erected for the purpose, it can be applied to such building for a sum in many cases less than the estimate would be for furnishing it in the usual manner, without the ventilation. The subscriber wants no money down, but is willing to alienate his right for a trifling reservation upon each building ventilated. Letters post-paid to the lines will receive immediate attention until the first of June next. H. RUTTAN.

Coburg, Canada West, 8th April, 1850. 32 6*

THE AMERICAN UNION—The most carefully written and best arranged Paper in the United States. This Popular Paper is supplied with Selected Stories Humorous Sketches, Tales of Travel; Romances, Sketches of Real Life, Biographies, Poetry Serious Sentimential, and Humorous; Gems from New Works, Local Matters, Reviews Agricultural Treasuries, Scientific Novelties, Anecdotes, Glimpses of the Law, Opinions, Correspondence, Foreign and Domestic News, Congressional and Legislative Intelligence, Accidents and Casualties, Financial Articles, Markets, Miscellaneous Editorial Articles, amusing sketches, facts and fancies, such as never before has been in one publication. As a General Family Paper it is unsurpassed for the variety and completeness of its contents, and for the great care that is taken, while it shall amuse, to instruct and elevate the mind to a sense of its natural dignity. For the old, it will be found stored with experience—for the young, it will possess a charm that will not contaminate or cloy the taste. Published weekly by R. B. FITTS & CO., 22 School Street, Boston, Mass. Terms—Two Dollars per aunum, payable in advance. 32 8*

MANUFACTURERS' SUPPLY STORE. The subscribers would call the attention of manufacturers generally, to his stock of articles for the use of factories, both cotton and wollen, consisting of every variety and kind used by them, which he can offer at as fair rates as any other establishment in this or any other market.

He has also constantly on hand a full assortment of Leather Belting, revetted, stretched, and cemented, of all sizes, made from the best material, and in the best manner, warranted equal, if not superior to any made in this country, and at prices which must be satisfactory to those wishing a superior article. He is also agent for the sale of Cotton and Woolen Machinery of the most improved kinds. Those favoring him with a call will be satisfied, both in regard to quality and price. P. A. LEONARD, 66 Beaver st.

23 3m*

COTTON, WOOLEN AND SILK MANUFACTURERS' DEPOT.—ANDREWS & JESUP, No. 70 Pine st., N. Y., dealers in articles for the use of Cotton, Woolen and silk manufacturers, and agents for the sale of shearing, carding, burring, napping, wool-picking, flock-cutting and waste machines, regulators, satinet and jean warps, &c. Weavers' reeds and heddles, bobbins and spools, of every description, made to order. Sperm, lard and olive oils and oil soap. 34tf

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FOR SALE—A second-hand Upright Steam Engine of six horse power, with Cylinder Boiler of 22 feet long, 24 inches diameter, together with fly-wheel and shaft, pump, furnace, and bars, complete.—This engine is one of Burden's make: has been used in all about four months, and is in capital order. The engine will occupy about 3 feet square, fly-wheel weighs about 550 lbs., and will be sold for the low sum of $550, delivered on ship board in good order. A draft for the above amount may be sent to

34 MUNN & CO.

MATTEAWAN MACHINE WORKS.—Locomotive Engines, of every size and pattern. Also tenders, wheels, axles, and other railroad machinery. Stationary engines, boilers, &c. Arranged for driving cotton,, woolen and other mill. Cotton and woolen machinery of every description, embodying all the modern improvements. Mill geering, from probably the most extensive assortment of patterns in this line, in any section of the country. Tools, turning lathes, slabbing, planing, cutting and drilling machines. Together with all other tools requred in machine shops. Apply at the Matteawan Co. Work, Fishkill Landing, N. Y., or at No. 66 Beaver st. New York City, to

24tf WILLIAM B. LEONARD, Agent.

MACHINERY.—S. C. HILLS, No. 12 Platt Street, N. Y., dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines, Dick's Presses, Punches, and Shears; Morticing and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c. Letters to be noticed must be post paid. 33tf

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FOREIGN PATENTS.—PATENTS procured in GREAT BRITAIN and her colonies, also France, Belgium, Holland, &c., &c., with certainty and dispatch through special and responsible agents appointed, by, and connected only with this establishment.—Pamphlets containing a synopsis of Foreign Patent laws, and information can be had gratis on application

JOSEPH P. PIRSSON, Civil Engineer,
33tf Office 5 Wall street, New York.

JONATHAN TAYLOR, Machinist, Montgomery, Alabama, begs leave to inform inventors and the public in general, that he is prepared to make patterns and models to order. He is also desirous of being appointed agent for the disposal of all kinds of patent machinery. Office on Commerce street, two doors from the Exchange Hotel. All letters must be post-paid. 32 10*

SASH AND BLIND MACHINE—Patented by Jesse Leavens, of Springfield, Mass., is the best Sash and Blind Machine now in use. The Machine cost $300 at the shop where they are made, near Springfield—extra charge for the right of using. The machine does all to a Window Sash and Blind except putting them together. Orders from abroad will be promptly attended to, by addressing JESSE LEAVENS, Palmer Depot, Mass. 22 20t*

TO SOUTHERN MANUFACTURERS and Sugar Planters.—The advertiser a practical machinist and engineer, at present employed as chief engineer of one of the largest manufacturing companies in New England, is desirous of locating South. Address M., Engineer, Lowell Mass. 35 6*

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Scientific Museum.

Bronze.

Bronze is a compound metal, consisting of copper and tin, to which sometimes a little zinc and lead are added. The alloy is much harder than copper, and was employed by the ancients to make swords, hatchets, &c., before the method of making iron was understood.—The art of casting bronze statues may be traced to the most remote antiquity; but it was first brought to a certain degree of refinement by Theodoros and Rœcus of Sarnos about 700 years before the Christian era, to whom the invention of modelling is ascribed by Pliny.—The ancients were well aware that by combining copper with tin a more fusible metal was obtained, that the process of casting was therefore rendered easier, and that the statue was harder and more durable; and yet they frequently made them of copper nearly pure, because they possessed no means of determining the proportions of their alloy. and because by their mode of managing the fire, the copper became refined in the course of melting, as has happened to many founders in our own days. It was during the reign of Alexander that bronze statuary received its greatest extension, when the celebrated artists, Lysippus, succeeded by new processes of moulding and melting to multiply groups of statues to such a degree that Pliny called them the mob of Alexander. Soon afterwards enormous bronze colossuses were made to the height of towers, of which the isle of Rhodes possessed no less than one hundred.

The Roman consul, Mutianus, found 3,000 bronze statues at Athens, 3,000 at Rhodes, as many at Olympia, and at Delphi, although a great number had been previously carried off from the last town.

In forming such statues the alloy should be capable of flowing readily into all the parts of the mould, however minute; it should be hard, in order to resist accidental blows, be proof against the influence of the weather, and be of such a nature as to acquire that greenish oxidized coat upon the surface which is so much admired in the antique bronze. The chemical composition of the bronze alloy is a matter therefore of the first moment. The brothers Keller, celebrated founders in the time of Louis the Fourteenth, whose *chefs d'œuvre* are well known, directed their attention towards this point, to which too little importance is attached at the present day. The statue of Desaix, in the place Vendome in Paris, are noted specimens of most defective workmanship from mismanagement of the alloys, of which they are composed.

On analysing separately specimens taken from the bas-reliefs of the pedestal of this column, from the shaft, and from the capital, it was found that the first contained only 6 per cent. of the alloy, and 94 of copper, the second much less, and the third only 0-21. It was therefore obvious that the founder, unskilful in the melting of bronze, had gone on progressively refining his alloy by the oxidisement of the tin, till he had exhausted the copper, and that he had then worked up the score in the upper part of the column. The moulding of the several bas-reliefs was so ill-executed that the chissellers employed to repair the faults, removed no less than 70 tons of bronze, which was given them, besides 300,000 francs, for their work.

The alloy most proper for bronze medals, which are to be afterwards struck, is composed of from 8 to 12 parts of tin, and from 92 to 88 of copper; to which if 2 or 3 parts in the hundred of zinc be added, they will make it assume a finer bronze tint. The medal should be subjected to three or four successive stamps of the press, and be softened between each blow by being heated and plunged in cold water.

Bell Metal.—The bronze of bells or bell is composed in 100 parts of 78 copper and 22 tin. This alloy has a fine compact grain; is very fusible and sonorous. The other metals sometimes added are rather prejudical, and merely increases the profit of the founders.—Some of the English bells consists of 80 copper, 10·1 tin, 5·6 zinc, and 4·3 lead; the latter metal when in such large quantity is apt to cause insulated drops, hurtful to the uniformity of the alloy.

The Chinese gongs are composed of 78 parts copper, and 22 parts tin. This alloy when newly cast is as brittle as glass, but by being plunged at a cherry-red heat into cold water, and confined between two discs of iron to keep it in shape, it becomes tough and malleable.—The Chinese cymbals consist of 80 parts copper, and 20 parts tin.

Common Metal—Consists of about 90 or 91 copper, and 9 or 10 of tin. Never less than 8 or more than 11 parts of tin in the 100 should be employed.

Speculum Metal—One part of tin and two parts (or more exactly 100 parts tin and 215 parts copper) from the ordinary speculum metal of reflecting telescopes, which is of all the alloys the whitest, the most brilliant, the hardest, and the most brittle. The alloy of 1 part tin, and 10 of copper, is the strongest of the whole series.

The bronze founder ought to melt his metals rapidly, in order to prevent the loss of tin, zinc, and lead, by their oxidizement. Reverberatory furnaces have been long used for this operation, the best being of an elliptical form. The furnaces with dome tops are employed by the bell founders, because their alloy being more fusible, they do not require so intense a heat; but they also would find an advantage in using the most rapid mode of fusion. The surface of the melting metals should be covered with small charcoal or coke, and when the zinc is added it should be dexterously thrust to the bottom of the melted copper. Immediately after stirring the melted mass so as to incorporate the ingredients, it should be poured out into the moulds. In general the metals most easily altered by the fire, as the tin, should be put in last. The coating should be as quick as possible in the moulds to prevent the metals separating from each other in the order of their destiny, as they are very apt to do so. The addition of a little iron, in the form of tinplate, to bronze is reckoned to be advantageous.

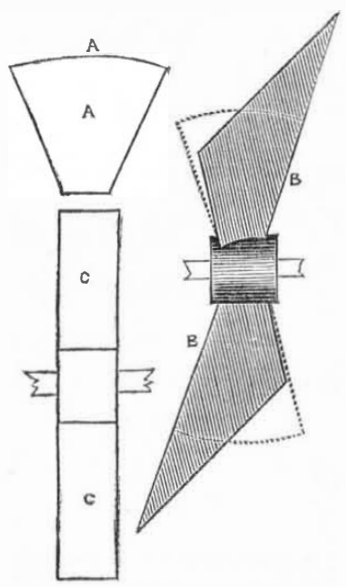
History of Propellers and Steam Navigation.

[Continued from page 288.]

MR. EWBANK'S (COMMISSIONER OF PATENTS) EXPERIMENTS.

Having presented the main points of the Report of Mr. Ewbank, Commissioner of Patents, so as to convey a clear idea of his experiments and the conclusion at which he arrived, as to what constituted the best form of blades for propelling vessels, we will now conclude our extracts from the same with the following illustration :—

Fig. 57.



Devices for readily lengthening and shortening the arms, so as to vary the dip with the changing draught of a vessel, and accurately to adapt it to the power of her engines, are worth adopting.

The principle is of course equally applicable to stern submerged propellers, revolving sculls or screws. In these the ancient forms are the latest also. Those last patented were proposed over a century ago. A is an outline of Woodcroft's patented here in 1846, and in England previously. Those of Stevens, Loper, Ericson, Smith, and a host of others, have the same sectorial form. Their resemblance to the tails of slow-swimming fish is obvious to every eye. Would it not be better to make each more like the lobe of the most agile and swift, as at B B? A rectangular blade—not unlike one belonging to a paddle-wheel attached to the axis endwise, as at C C, has also been recommended, though on what grounds it is not easy to perceive. The Great Britain steamship had blades resembling those figured at C C.

Although we have not presented all the figures in the Report spoken of, there is not an essential one left out. A full and complete idea of its features is set forth.

He believes that thick blades are a drawback to speed, and that thin metal blades should be substituted—[oblique metal blades have been proposed before, as we shall show by and bye.] We have seen many reviews of this part of Mr. Ewbank's Report, which, in our opinion, were not candid ones. The whole of the Report is based upon experiments, and these are presented, and what can be more fair than this? Experiment is the only way to test a principle.

Mr. Ewbank endeavors to inculcate the lesson of following *nature* in mechanical philosophy, as being the best guide and in reference to propulsion, he says, "if ever nature took extra pains to teach engineers a lesson, she has done it here, and let them never forget that nature and natural philosophy are *never* at variance." While we subscribe to the latter sentiment, we would state that the only difficulty in the way of following after nature, lies in our acquaintance with, or ignorance of, *nature's laws*,—and more than this, man must look to more than the sight of his eyes to follow after in nature, so as to guide him in mechanical philosophy. The God of Heaven has given him reason to lead him above a mere copyist—to be a *creator* in his own world, himself—because he is formed in the image of his Creator, who created him and made him *lord* of the world.

If man had never soared above natural presented objects, he never would have constructed a carriage to move on wheels. The first locomotive was constructed with legs like a deer, because the swiftest of animals used such propellers, but such a method of propulsion was not equal to rolling wheels; and in what part of nature's labrynth did Stephenson get his first lesson of the "Rocket." The same kind of reasoning is applicable to the paddle wheels of steamboats. No fish or fowl uses rotary propellers—all of them employ reciprocating propellers, and it was copying after nature which led the ingenious Earl of Stanhope to employ what is termed the "Duck's Foot Propeller." It is well known, as we have shown in the preceding parts of our history of propellers, that the devices for this purpose are "legion," while none have been able to maintain the field against the oblong rectangular blades of the paddle wheels as they are at present constructed. We must look to every obstacle which has to be overcome, and when we consider the mighty storms of the Atlantic—the huge waves beating against the vessel's sides like battering rams, we must look to strength in construction, as well as to the best form for speed. The race horse for the race-course, the hunter for the wood and the wild. The Report is unfavorable to the use of split paddles, but by the recent voyage of the Atlantic to Liverpool, she having whole blades, is a sure evidence that the split paddle is the best for strength, and the experience of the foreign steamships corroborates this assertion.

We believe, however, that our screw propellers should adopt the ideas presented in the above engraving—the improvement appears to be like a self-evident axiom, requiring no debate.

A saturated solution of acetate of lead, in distilled water is an excellent test, detecting the presence of the minutest quantity of sulphuretted hydrogen, and more convenient than the carbonate, from its complete solubility.

The Rothschilds.

It is said that the fortune of the Rothschilds is not less than seven hundred and thirty-five millions of francs, or twenty-nine millions four hundred thousand pounds British money, about one hundred and forty-five millions of dollars.

LITERARY NOTICES.

The New Testament, (Illustrated.)—Messrs. Hewett & Spooner, 106 Liberty street, have just published the most beautiful edition of the New Testament that has ever been published. It is full of embellishments, illustrative of the various scenes that are recorded in the New Testament, and the letter-press of it is superb. It appears before the public with the full approbation of the clergy, many of the most prominent of whom have furnished the publishers with testimonials. The illustrations of this Testament are from paintings of the most celebrated artists, among whom we notice the names of Raphael and Reynolds, they being, probably, the two best delineators of Bible scenes that have ever been copied.

The Graefenberg Co., 214 Broadway, have laid upon our table a copy of the "Manual of Health," beautifully bound in cloth, for which they charge only 75 cents per copy. Since our former notice, we have read this work carefully, and we can say unqualifiedly, that a better digest of disease and its proper treatment cannot be found. It presents to the reader a careful comparison of the different systems of practice, besides an able and well written history of the Science of Medicine and Pharmacy, together with hundreds of receipts. This edition is designed for the library.

Specimens of the Stone, Iron, and Timber Bridges &c., &c. of the U. S. Railroads. By George Duggan, Architect, and C. E.—Part V. contains beautifully executed plans, elevations and sections of the pine timber Viaduct across the Canewacta Creek, at Lanesboro', Pa., and the details of the Starrucca (stone) Viaduct near Lanesboro', Pa., on the line of the N. Y. and Erie R. R., with specifications, estimates, &c.

No. 16 of Shakespear's Works, published by Phillips, Sampson & Co., Boston, has been sent us through Dewitt & Davenport, Tribune Buildings. It contains the tragedy of "Macbeth," and a splendid engraving of Lady Macbeth. Price 25 cts. per No.

We are indebted to the same Publishers for the 4th vol. of their excellent edition of Gibbon's History of Rome. Vols. 1, 2, 3, and 4 are for sale by Dewitt & Davenport, at 62½ cts. per vol., bound in cloth.

Godey's Lady's Book, for June, is upon our table with the compliments of H. Long & Bro., 43 Ann st. It is richly embellished, and contains a great amount of choice reading from the first authors.

Holden's Dollar Magazine, June Number, appears upon our table, arrayed in its best garb both in matter and illustrations, evincing a steady improvement in all respects since its commencement.—A more high toned monthly cannot be found in this or any other country.

Nine lectures of John B. Dods, upon the subject of the Philosophy of Electrical Psychology. This subject relates to the reciprocal action of matter and mind upon each other, and is treated by Dr. Dods in a most brilliant manner. Published by Fowlers & Wells, price 37 ½—can be sent by mail.

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